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Technologists Say Engine Design Cannot Take Place of Anti-Knock Fuel

By Paul Truesdell

CLEVELAND, Sept. 12

FOR three or four years or more we have been hearing about the day when motor car engines would have much higher compression ratios than any ever known before. It has been said that these higher compression engines would have speed, pickup, power, economy and general all around performance never dreamed of before.

It has been stated that the advent of these engines only waited on the day when motor fuel that would run them without knocking was generally available.

Today several thousand of these new, high compression cars are running on American city streets and country highways. And they are running on the gasoline that is available. By high compression is meant compression pressure substantially higher than those prevailing in 1926 and early 1927 models. The highest compression ratio in any car being sold it is understood is 6.3 to 1.

While there are a number of these high compression cars in service, they are by no means widely scattered over the country as yet. They are still pretty new. The most interesting question in the minds of the oil industry is: "Is the satisfactory operation of these high compression cars made possible because of improved mechanical design or must they operate on a fuel of exceedingly high anti-knock value?"

At least one large manufacturer who is putting out high compression cars is advertising extensively that his cars have engines that give all the benefits of high compression and yet will run on any gasoline. In other words, it is claimed that the knock has been licked by mechanical design.

Coming Next Week

THE long looked for Engineering Number of National Petroleum News.

It will contain the greatest number of special articles on new developments in the producing, refining, natural gasoline and marketing branches of the oil business ever offered a reader in one volume.

Contributors are leading engineers with oil companies and allied equipment and supply companies picked because of their knowledge of the particular phases of the industry on which they have been asked to write.

Because of the value of these articles this Sept. 15th issue of National Petroleum News will be prized by many readers as a reference book.

One large oil company, marketing a standard gasoline in competition with Ethyl gasoline and various benzol blends, in order to get a clear picture of the situation; bluntly, whether the newer cars would have to be operated on Ethyl gasoline or its equivalent to give satisfactory performance, employed an automotive engineer of high standing to survey the situation and report. Extracts from this engineer's report follow:

"The present tendency to raise the compression ratio of the new model motors is not based upon the use of special fuels but is the result of logical technical development in the use of present standard undoped fuels.

"It has been well established that the smaller the cylinder and the higher the speed the higher the actual compression pressures may be carried with a given fuel before the detonation limit is reached. Furthermore, in order to attain the higher speeds, it becomes necessary to so time the inlet valve closing that the filling of the cylinder at the lower speeds is materially reduced, thus lowering the actual compression pressure under low speed conditions at which knock and roughness are most noticeable and objectionable.

"In my opinion the more modern high speed high compression motors are no more subject to objectionable detonation with standard fuels than is the older, slower, lower compression types."

STATING that the development of the supercharger which he believes is imminent on passenger cars, probably would favor anti-knock fuels and may become the dominating factor in the situation, this engineer goes on to say:

"I am in close touch with the development by one of the prominent motor companies of a new form of combustion chamber which has given unexpected and quite extraordinary results along lines of suppressing detonation with high compressions (up to 7½ to 1) with standard fuels. This development has not yet reached the commercial stage and it would be premature to attempt to forecast its effect on the fuel situation. It is mentioned merely as indicating the uncertainty of the fuel problem as a whole."

Then the engineer gives credit to the chemist as follows:

"It seems highly probable that the chemist has not made his final contribution toward high compression

fuels. Much serious work is being done along this line by able experimenters and we may expect new developments from this source at any time."

And then he goes on to take a slant at the economics of the situation and to admit that anti-knock fuel has its advantages. He says:

"As to the possible demand for anti-knock fuel in present type motors, I have no data available and can therefore give no considered opinion. There is, however, no question that the majority of present motors when carbonized, will run more smoothly with anti-knock fuels at wide open throttle when warmed up. It is a question how far this fact will influence the public to pay a premium for such fuel.

"I would suggest that any new fuel for which special virtues are loudly claimed, whether truthfully or otherwise, will draw a temporary experimental patronage which will fall away under the pressure of higher price. Suggestion and imagination play a large part in the temporary acceptance by the public of low cost motor products, but eventually price will dominate the situation except where very real advantages are apparent. I believe that present motor fuel consumption statistics should be interpreted with this condition in mind."

THE Hudson is the car that is advertising most widely that it has a high compression car giving wonderful performance on any kind of gasoline. The new Hudson models have an "F" head engine and a compression ratio of about 5.5 to 1. The spark plugs are located in the side of the engine and offset from the piston. A description of the Hudson engine was published in the July 16 issue of "Automobile Topics." In this it is pointed out that the location of the spark plug behind the exhaust valve tends to prevent detonation. In the Hudson official explanation it is stated: "Instead of the violent initial explosion taking place immediately above the piston, it occurs at the remotest part of the special chamber

Cutaway view of combustion chamber of Hudson engine with intake valve open

which cushions its severity and greatly increases its power.

"By the time the pressure reaches the piston its violent harshness and roughness is entirely absent and the Hudson gets away with the dash and smoothness of the steam engine."

The article in "Automobile Topics", goes on to say:

"A PARTICULARLY advantageous feature is the inbuilt manifold which takes all the mixture through a single carburetor part in the side of the block and distributes it uniformly to the several cylinders. Many of the virtues of the design must rest upon this characteristic for the manifold temperatures are thereby held uniform while they also exercise some cooling influence on the motor head as a wohle.

"Even more intriguing is the general effect of the valve arrangement with respect to the twin problems of starting and crank case dilution. The inlet valve is located approximately midway between the center of the cylinder and the center of the exhaust valve. Its comparatively large diameter causes it to overlap both. Thus any liquid fuel that may be swept along by the incoming charge is carried out of the bottom of the manifold and impinges directly upon the head of the exhaust valve. This instantly vaporizes the fuel and at the same time cools the valve.

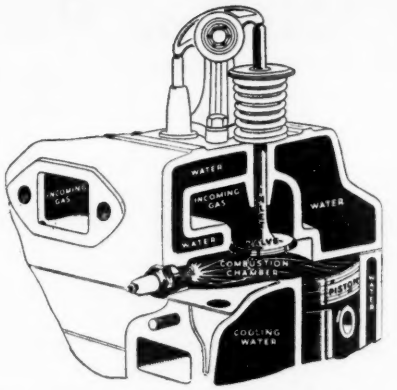
"The result is that wet gasoline on the cylinder walls is no longer a matter of concern. Even under peculiarly bad starting conditions, dilution troubles are not apprehended while easy starting and a rapid warmup seem absolutely assured. As evidencing the confidence that is felt in this regard the new motor is provided with a piston having in place of the not unusual oil ring at the bottom of the skirt, a mere ridge of the metal itself, formed by turning a V-shaped groove above and below the point where the wiper would naturally be located.

"THESE two grooves are both drained by holes drilled through the skirt so that the effect of the sharp-edged ridge is to wipe off surplus oil in both directions.

"These pistons, by the way, are of aluminum having the now familiar invar strut but in place of the single bar of non-expanding metal commonly employed, the Hudson piston is provided with two on each side or four struts in all instead of only two."

With the subject of high compression cars in mind and curiosity as to how far the engineers can go in eliminating knocking tendency of high compression engines by mechanical design, I attended the meeting of the American Chemical Society in Detroit last week.

I questioned at least 20 men, all well versed in automobile design and the action of fuels in automobile engines. Every one of them stated the belief that the designers can go only a comparatively short distance toward solving the knock problem by design of the engine.



Firing the charge in the cylinder on the new Hudson

IT HAS long been known that various modification of standard designs of cylinder heads, piston, location of spark plugs and so on exercise a considerable influence on the tendency of an engine to knock but it was the unanimous opinion of the technologists I talked with that it is after all a question of the fuel.

When the motor manufacturers state that their higher compression cars will run satisfactorily on "ordinary gasoline" it must be borne in mind that the ordinary gasoline of today is not the ordinary gasoline of 1926. It was stated by J. B. Hill Jr., chief chemist of the Atlantic Refining Co., stated in a paper read at the joint meeting of the Petroleum Division and the Division of Industrial and Engineering Chemistry at the meeting, that the anti-knock value of the average fuel sold today is 10 per cent higher than that of the average fuel sold a year ago.

That means that the gasoline now generally on sale is comparatively an anti-knock fuel. But it appears that the refiners will have to increase their efforts to better the anti-knock value of their gasoline because the automobile designers are hard on their heels. It seems likely that the general development of vapor phase cracking, which apparently is bound to come, will put in the reach of the motorist a motor fuel of high anti-knock value.

WASHINGTON, Sept. 13.—The Gulf Refining Co. today announced the acquisition of the Columbia Oil Co., one of the oldest local distributing companies in Washington, owning a number of gasoline stations in and around Washington. Heretofore Gulf products have been sold through local dealers, but the Gulf has never operated stations of its own here. Robert G. Worthington, president of the Columbia Oil Co., will enter the service of the Gulf company, it was announced.

Gasoline Price Report Hints At U. S. Regulation

WASHINGTON, Sept. 12

THE coming report of the Federal Trade Commission on gasoline prices will have a leaning towards government regulation or control of both crude production and gasoline prices, according to information from unofficial sources. It is not considered likely the report will be issued until Congress convenes again.

The commission may go so far as to intimate that it considers itself the proper authority to handle the regulation of gasoline prices.

The report cannot make a direct recommendation to congress for such regulation or control, because the resolution by Senator Trammell of Florida adopted by the Senate June 3, 1926 which started the commission on this investigation nearly 18 months ago, directed that body to find out merely if there was any agreeing among oil companies on gasoline prices. The report will acquit the industry of any efforts at price fixing, it is understood.

The report is still "in the Commission and still open to amendment," That is while the men who are officially known as experts, economists and the like have put their thoughts upon paper, the final approval of the Commissioners it is authoritatively understood, has not been given. Until the report is actually in the hands of the Senate it will be subject to change.

When the Senate meets it will be time for the trade body to submit its report. For the trade body to publish a report in response to a Senate resolution during the vacation of the Senate, would be belittling that body. It was prepared to submit a hurried report just before the end of the session on March 4. It decided, however, that it had better take more time and send in a better considered report.

As the report now stands, the oil industry will be acquitted of any efforts at price fixing. It will be accused, however, of making agreements to limit crude production in the Salt Creek field in Wyoming, in the Seminole field and in the Panhandle field. The government itself was a party to the arrangement in the Salt Creek field and what was done in the Seminole is a matter of recent publication. There probably will be dispute, when the report is made, as to the Panhandle field.

It is not likely that either the American Petroleum Institute, the Western Petroleum Refiners Association or the National Petroleum Association will be given an opportunity to check up on the allegations of fact contained in the report prior to its submission. It is understood that both R. L. Welch and Fayette B. Dow have made it clear that, in their estimation, the commission should not make a report on ex parte statements; that is, a report carrying averments of fact that have not been submitted to those who could deny them if they were inaccurate or explain them if they were misleading. The trade body never has given the parties in interest a chance to be heard in preparing its reports in response to resolutions of the House or of the Senate.

The evidence of competition, at least among the refiners, it is understood, has been so overwhelmingly against any theory of combination on price, as to make any other sort of report the quintessence of foolishness. However, the efforts of producers to prevent over production are to be treated as evidence of agreement to prevent production.

The report will contain large tables of figures about production of crude, or the output of refiners, prices and contrasts between the prices of petroleum products and other commodities. The comparisons of prices, of course, will show what every well informed man has known for years, that the increase in the prices of petroleum products have been much less than the increases in the prices of other commodities. In other words, that the prices of petroleum products have been so low that they have contributed much less to the high cost of living than other things. The price tables, it is understood, will be for every month since the beginning of 1922 with crude and gasoline sometimes above and sometimes below the prices at the beginning of the period.

Fuel oil, it is believed, will show less fluctuation than any other petroleum product, the demand for that, for the last five years having increased much more steadily than for any other product. A contributing factor to that steadiness of fuel oil prices, it is believed, has been the increase in the installation of cracking process units. With marine engines on one side and cracking process installations on the other, fuel oil, it is suggested, has not had much opportunity for playing the wandering boy. House-heating and gas-locomotives it is also suggested have been factors in that fuel oil equation.

A discussion of the economic side of the gasoline price query is expected in the report, as a matter of course. However surprising as it may seem, it is understood that the report will give little attention to the gas-air-lift factor in crude recovery and that but little space will be devoted to the cracking process.

Gov. Byrd Asks Coolidge to Hurry Gasoline Price Report

RICHMOND, Sept. 10

GOV. HARRY F. BYRD, of Virginia, wrote President Coolidge Sept. 8 urging him to have the Federal Trade Commission promptly make a report on the investigation of gasoline prices underway since June 1926.

The letter calls attention to evidence presented the commission by the governor that a Standard Oil Co. of New Jersey competitor had written a contract based on the S. O. New Jersey's published price; thus giving the Standard complete control insofar as these dealers are concerned. The governor said he presented the original of this contract to the trade commission.

Governor Byrd's letter also states that people of Virginia are paying more than $3,000,000 a year more than most South Atlantic and Eastern states for the same quantity of gasoline.

"I am unable to understand why the federal trade commission has made no report on the investigation requested by you nearly one year and a half ago," the letter reads. "I trust it may be your pleasure to direct the federal trade commission to make such a report promptly and especially to direct its attention to the information presented to the federal trade commission by me with respect to competitors of the Standard Oil company incorporating in their contracts a provision which gives to the Standard Oil Co. control of the wholesale price of gasoline."

The governor's public conference here Sept. 9 to determine why gasoline was from 1 to 3 cents a gallon higher in Virginia than in most states, lasted two hours, with oil company representatives questioning accuracy of price data supplied Governor Byrd by governors of 35 states.

After the governor's opening statement silence predominated for several minutes until the governor called on

E. C. Hall, counsel for Standard Oil Co. of New Jersey. Mr. Hall, in response to the governor's questioning on the accuracy of the data, replied that he thought there was confusion regarding the tank wagon price without state road tax and the service station price including the tax.

J. B. Belk, Albemarle Oil & Gas Co., Charlottesville, president of the Independent Oil Men's Association of Virginia, gave his opinion that the only possible way to reduce gasoline prices was to eliminate rebates and lease and license agreements between stations and oil companies. He pointed out that the installation of equipment by the oil companies necessitated a higher tank wagon price to cover these costs.

The conference ended abruptly when it was seen that the accuracy of the governor's data from other states was a stumbling block. Governor Byrd said he would check into the accuracy of these figures, making some public statement if they were not right. No announcement was made concerning the future of the conference.

Accident Prevention Program Laid Before Refiners

ATLANTIC CITY, Sept. 13

THAT the fire marshals organization of the National Petroleum Association assume also responsibility for prevention of accidents, carrying on that work at refineries in addition to its present work in fire prevention, was to be proposed to association members by H. N. Blakeslee, safety engineer of the petroleum section of the National Safety Council, at the opening session Sept. 14 of the 25th annual convention of the National Petroleum Association.

"Responsibility for accident prevention should be delegated to some individual in every plant." Mr. Blakeslee was to say. "It should be a pleasure to the fire prevention men within the companies of the National Petroleum Association to undertake this work which can be so beneficial to your organizations".

"Should you, as managers of your companies, delegate this work to your fire marshals, you must get the idea that the responsibility has been passed to the fire marshal, and that you, the managers, are relieved of further responsibility. You are making the fire marshal an accident prevention man to assist you in locating the hazards which may cause accidents, the same as he has been assisting you in locating hazards which may cause fire. If your fire marshal brings to your attention a situation which may cause a fire or an accident, and you as managers do nothing to change this situation and a fire or accident occurs, the responsibility will revert directly to you."

Mr. Blakeslee was to dwell on accident prevention as a good business policy. "It is an investment that pays dividends. When an accident occurs something has gone wrong. If the accident has been to machinery, usually the machine stops and production stops. If an injury has been to a workman, usually the injured workman and all those working around him stop work and frequently the machine is stopped. Production ceases but production costs continue.

"Accident prevention thought has resulted in the development of many efficient methods and tools in the petroleum industry. It was told to me in a small refinery in the Mid-Continent area that a year ago the refinery was losing money. A new superintendent took charge of the refinery. He cleaned the property up, eliminated leaks and practices which were creating hazards, organized his force for fire and accident prevention work, and the refinery is now making money even under present adverse market conditions. Incidentally the refinery is operating with a smaller working force than it had before. Invariably, high accident costs accompany high production costs.

Air Travel Costs as Low as 5½ Cents a Mile

CLEVELAND, Sept. 13.—It costs only 5½ cents a mile to operate an airplane that flies at least 1,000 hours a year and only 10 cents a mile for an airplane that flies 300 hours a year. These figures were computed by C. W. Shaw, Wichita, Kans., of the Travel Air organization which operates passenger planes in the southwest.

The cost figures included motor and plane depreciation, breakage or insurance, gasoline and oil, interest on the investment in the airplane at 6 per cent and hangar rent. Depreciation was figured on three years as the life of the plane.

Mr. Shaw's cost figures as given out by the Travel Air organization are based on actual flight records. Detailed figures follow:

At 1,000 Hours a Year

Motor depreciation	$1.00
Plane depreciation	.60
Breakage or insurance	1.00
Gas and oil	2.05
Interest on $2,785 for three years at 6%	.17
Hangar storage at $15 a month	.18
	$5.00

Air mile cost 55c at 90 M.P.H.

At 700 Hours a Year

Motor depreciation	$1.00
Plane depreciation	.76
Breakage or insurance	1.43
Gas and oil	2.05
Interest on $2,785 for three years at 6%	.24
Hangar storage at $15 a month	.25
	$5.73

Air mile cost 63c at 90 M.P.H.

At 300 Hours a Year

Motor depreciation	$1.00
Plane depreciation	1.57
Breakage or insurance	3.33
Gas and oil	2.05
Interest on $2,785 for three years at 6%	.55
Hangar storage at $15 a month	.50
	$9.00

Air mile cost 10c at 90 M.P.H.

These figures do not include pilot's salary or ground help needed at every flying field. It is not stated whether the breakage charge includes repairs. On their face the figures indicate the average is the cost of keeping a machine in the air or storing it when on the ground.

However, the organization says it has been found cheaper for business men in many cases to travel by airplane than by rail because of the time saved. The organization cites the case of four Wichita, Kans., business men—J. H. Turner, J. S. Brown, J. H. Engstrom and George Siedhoff—who recently made a six-day tour of Oklahoma and Texas, visiting Oklahoma City, Fort Worth, Waco, Houston, La Ward, San Antonio, Austin and Dallas, returning by way of Oklahoma City. They traveled 1,450 miles in 14 hours and 45 minutes actual flying time. It was figured the same trip would have required 64 hours' travel by rail.

32 Spaces Still Unsold For A.O.M.A. Meeting

CHICAGO, Sept. 9.—Thirty-two exhibit spaces at the convention of the American Oil Men's Association in the West Baden Springs hotel, West Baden, Ind., Nov. 2, 3 and 4 remain to be sold, according to James A. Gilmore, secretary of the association, and E. G. Weimer, secretary of the National Oil Equipment and Exhibitors Association, Chicago. It was erroneously published in the Sept. 7 NATIONAL PETROLEUM NEWS that 41 of 42 spaces had been sold.

Space for the convention sold so far is the most this association has ever disposed of. Mr. Weimer said he expected to dispose of the open space before the convention which is almost two months hence.

The convention dates fall on Wednesday, Thursday and Friday, a day later than has been the custom for A.O.M.A. conventions in the past. The big day of the meeting will be Thursday, Nov. 3, and the leading feature of the convention will be in the forenoon. The afternoon will be given over entirely to the Indiana Jobbers who will meet with the A.O.M.A. this fall. The banquet will take place Thursday evening.

Names of speakers and topics have not been announced.

Little River Royalty Owners Go to Court To Upset Proration Agreement

By Lawrence E. Smith

Bulletins

By Telegraph

TULSA, Sept. 13.—Judge Crump today vacated the restraining order issued last week against the Little River proration plan. Plaintiff probably will appeal.

* * *

By Telegraph

TULSA, Sept. 13.—Considerable revision of the present proration plan in the Little River field will have to be made, it was declared by several operators in that area at the meeting held in Tulsa this morning.

Pressure being brought by royalty owners and threats of suits for damages because of the restricting of production, together with the fact that the plan of holding wells to 100 barrels per day brings on an operating problem almost impossible to handle, are factors influencing the desire to change the plan.

One suggestion is to greatly increase the amount permitted from each well, and another is to throw in Little River as part of the whole district and prorate all of it to 450,000 barrels daily.

Operators adjourned until later in the day to await word from the district court at Wewoka, where decision was due on the operators' motion to vacate the injunction issued last week against pinching in one of the wells.

The field continued to assume big proportions. The Mid-Continent Petroleum Corp.'s No. 2 well, north of the discovery, is in for upward of 4,000 barrels daily, although lower on structure by nearly 300 feet than the discovery.

TULSA, Sept. 10

JUST as the operators in the Little River field were getting nicely started on their aerial act on the slack wire of restricting production, jeers and catcalls from the audience of royalty owners upset their composure. As a result the act was wabbling noticeably at the end of the week.

One C. L. Moss, a royalty owner holding an interest in the 10-acre M. A. House lease of the Indian Territory Illuminating Oil Co., went into the district court at Wewoka and obtained an injunction against the corporation commission, Umpire Ray M. Collins and the I. T. I. O. company. This order, a temporary one, prohibits the three defendants from restricting the production on this lease. Judge Crump, who issued it, set Oct. 8 as date for hearing.

It happens that the date for this hearing is three days after the corporation commission's order on Little River and other parts of the district terminates. It became effective Aug. 5, and was to run for 60 days unless decision was made to continue it after that date. The order, which was made by the commission on motion of the attorney general, embodied details of a plan that had earlier been drawn by the operators and the umpire. It covered also the shooting of wells and new pools that might be opened during the 60-day period.

Following the issuance of the writ by Judge Crump, Umpire Collins, who was designated by the corporation commission as its agent in enforcing the order, went into action, assisted by legal representative of the commission and an assistant attorney general. Motion was made to Judge Crump to vacate his order. Hearing was held Sept. 10.

THE question of jurisdiction of the district court is involved. The law of the state provides that appeals from orders of the corporation commission shall be taken directly to the supreme court. If the constitutionality of the act under which the commission issued the order, which was on the broad theory of prevention of waste, were attacked, it would come in federal court. Attorneys professed to be puzzled as to why the litigant started off in district court.

This royalty owner lives in Wetumka, Okla. The well on the tract in question was partly pinched in at the close of the week but was making 50 barrels per hour. It is capable of doing much more and the litigant wants all that he can get. This attitude on the part of royalty owners is not new and has been extremely vexatious to the oil companies. The royalty owners want all they can get at the moment and the argument that unrestricted production will break the market is fruitless. They proceed on the theory that half a loaf is better than none.

ANOTHER bit of confusion on the Little River situation arose during the week from the Blackwell Oil & Gas Co. began producing its wells to greater capacity than permitted in the commission's order. This company had trouble producing at all when the wells were pinched in to the extent that would be required to yield only 100 barrels per day. There is not much pressure and the wells die when closed in so drastically. The Blackwell opened up two wells to production through one-half inch choke, feeling that they couldn't get them to make anything through smaller opening. Naturally, they produced much more than the stipulated figure.

As a matter of fact, none of the wells have been held down to the 100-barrel daily mark for any worth while period. If they take those large producers and get them down to 40 barrels per hour, that seems to be as much as can be expected. Doubtless, if the plan continues and all the legal difficulties are cleared out of the way, some modifications of the commission's order will be sought.

A general meeting of interested operators was called during the week for Sept. 13, in Tulsa. The umpire issued the call and he was expected to report on the progress made in Little River.

Reverting to the attacks being made by royalty owners on the plan being pursued in Little River, a whole set of fundamental questions is opened. If the lease contracts mean all that some attorneys say they do in imposing an obligation to produce oil once it is found, there may be quite a bit of trouble in the offing, not only in Oklahoma but elsewhere. Whether the corporation commission has the authority to declare, in effect, a moratorium on contracts when economic conditions are unfavorable—assuming that the lease really does impose the obligation to produce the wells to maximum—is one of the questions. It is almost inconceivable that law could be so construed as to compel the man who spends the money and takes the risk to put his product on the market when the price is below cost of production, but some weird things have happened heretofore in court interpretation of the rights of a lessee.

Yates Field Proration Plan Avoids Surface Storage

HOUSTON, Sept. 9

AVOIDANCE of above-ground storage in or adjacent to the Yates field, eastern Pecos county, is contemplated at the present stage of proration plans affecting this west Texas district. The oil will be allowed to come to the surface only as transportation facilities permit, the wells of operators being pinched in, so as to retain the remainder of the field's potential yield in its natural reservoirs.

Agreement on proration was reached at Fort Worth Sept. 8, at a meeting of a committee named a week previously to work out details of equitable division of crude oil takings from all producing leases in the field.

An executive committee composed of W. A. Moncrief of the Marland Oil Co. of Texas, Warner Clark of the California Co., and M. E. Wagner of the Mid-Kansas Oil & Gas Co., working with a general committee of which they are also members, will administer the proration program. As at present contemplated no individual umpire will be appointed.

Another meeting of the general committee composed of representatives of all operators interested in the Yates field development, will be held in Fort Worth, Sept. 15, for formal ratification of details worked out by the executive committee.

All doubts about participation in the plan by Mid-Kansas Oil & Gas Co., subsidiary of Ohio Oil Co., were removed at the meeting Sept. 8, when M. E. Wagner, of the production department of that company at Tulsa, was named as one of the three members of the executive committee administering the machinery of proration.

Soon after Oct. 1, next, the time when Humble Oil & Refining Co. has promised to begin taking 30,000 barrels of crude daily from Yates field producers, the total outlet from the Pecos county area will reach a total of 44,000 barrels daily. The additional 14,000 barrels of outlet will be provided by IHinois Pipeline Co., companion corporation to Mid-Kansas Oil & Gas Co., which is engaged in building an 8-inch pipeline a distance of 140 miles from the Yates field to Del Rio, on the Southern Pacific railroad.

The corrosive influence of sulfur in west Texas oil affects carrying costs of crude stocked at tank farms adjacent to the fields, hence the desire of operators to avoid any greater construction of steel storage in the region than absolutely necessary. Although competitive conditions of field developments in some other parts of the Permian age salt basin west of San Angelo made the construction of tank farms necessary in certain cases it was hoped that this could be avoided in the Yates field area. Apparently this problem has been solved by Prorating companies recognizing an almost impossible economic situation to arise from sulfur corrosion of tanks and equipment with crude stored in quantity.

Texas law is construed as not permitting limitation of production, storage or marketing by agreement, hence the prorating plan calls for each operator having a share in the available crude outlet equal to the proportion his potential production bears to the potential production of the entire field.

Potential figures will be reached by open flow gages of wells in the entire field to be taken before Oct. 1 in the presence of representatives of operators and the pipelines. Thereafter, the field will be gauged on the 1st and 15th of each succeeding month. No wells drilled in the interim will be taken into account until the next gauge period. Neither will any limitation be placed on the number of wells to be drilled by the individual operator, who will be governed under the plan by economic and physical outlet restrictions. Shooting of wells and the application of air-gas lift methods of crude oil recovery will be banned in the period of proration.

New pipeline outlets, when, if and as built, will bring about revision of the quantity of oil to be taken from the field. In case the capacity of the Illinois Pipeline is in excess of the production allowed the Mid-Kansas and its operating partner, the Transcontinental Oil Co., the line room thus created would go to take care of the allotment of other operators. The excess of allotted production of the Mid-Kansas & Transcontinental partnership, over and above the quantity handled through the affiliated Illinois pipeline, would fit in with the proration of crude finding its outlet through Humble facilities.

Parties to the proration agreement are: The California Co., Gulf Production Co., Humble Oil & Refining Co., Marland Oil Co. of Texas, Mid-Kansas Oil & Gas Co., Phillips Petroleum Co., Pure Oil Co., Roxana Petroleum Corp., Skelly Oil Co., Simms Oil Co., Tidal Oil Co., Transcontinental Oil Co., Kirby Petroleum Co., Independent Oil & Gas Co., McMan Oil & Gas Co., Allsman & Bell, a partnership, Red Bank Oil Co., Mazda Oil Corp., Wheelock & Collins.

To Visit Exposition

LOS ANGELES, Sept. 12.—Leaving Los Angeles Sept. 18, Joseph Regan, president, and Bert Cleveland, sales manager, Regan Forge & Engineering Company, expect to spend from six to eight weeks in the east. They will visit the Exposition at Tulsa and will then make an extensive tour through the Mid-Continent and Gulf coastal fields, spending several days in Pampa, the Seminole field and in Oklahoma City. They will also visit their offices in Houston and New York City. Returning they will make several calls in several oil fields and will stop in Chicago and St. Louis, returning to California about November 1.

Index to Coming Meetings

Illinois Petroleum Marketers Association, Soengataha Country Club, Galesburg, Ill., Sept. 15.

Ohio Petroleum Marketers Association, Miami Hotel, Dayton, O., Sept. 22, 23.

Fourth International Petroleum Exposition and Congress, Tulsa, Sept. 24 to Oct. 1.

Petroleum Section, National Safety Council, Hotel Stevens, Chicago, Sept. 27 to 30.

North American Gasoline Tax Conference, Deshler - Wallick Hotel, Columbus, O., Oct. 3, 4, 5.

Big Four State Jobbers, Kansas City, Mo., Oct. 4, 5, 6.

Fuels Division, American Society of Mechanical Engineers, St. Louis, Mo., Oct. 10, 11, 12, 13.

Wisconsin Independent Oil Jobbers association, Plankinton Hotel, Milwaukee, Oct. 12.

Petroleum Division, A. I. M. E., Texas Hotel, Fort Worth, Tex., Oct. 19, 20.

Independent Oil Men of America, Congress Hotel, Chicago, Oct. 24, 25, 26.

American Oil Men's Association, West Baden Springs Hotel, West Baden, Ind., Nov. 2, 3, 4.

Indiana Independent Petroleum Marketers Association, West Baden Springs Hotel, West Baden, Ind., Nov. 3.

American Petroleum Institute, Hotel Stevens, Chicago, Dec. 6, 7, 8.

Tests Reported Show Possible Danger In Widening Sulfur Limit

By Paul Truesdell

CLEVELAND, Sept. 13

THE symposium on safe allowable limit for sulfur in gasoline, which had been planned for the meeting of the Petroleum Division of the American Chemical Society, held in connection with the general meeting of the society in Detroit beginning Sept. 5 was altogether one-sided.

Only two papers were presented in the symposium and both gave the results of experiments which convinced the authors that the present limit specified by the Federal Specifications Board should not be widened and the bars thus let down for possible extensive damage to the country's automotive equipment.

The question, "how much sulfur is it safe to leave in gasoline without fear of injuring automobile engines?" has been much debated for the past two or three years. A large number of the oil technologists have argued that the limit of .1 per cent allowed by the Federal Specifications Board is needlessly low. While the specifications of the board are not officially binding except on products bought for the use of the government, it is general practice in the trade to accept them and to buy products accordingly.

It was argued by proponents of a wider sulfur limit that holding sulfur down to .1 per cent imposed needless hardship and expense on many refiners working with high sulfur crudes in treating their product to meet these specifications. The statement was made repeatedly that sulfur content of .5 per cent could be allowed without damage to automotive engines and therefore that the extra expense to which certain refiners were put to meet the government specifications did not bring any compensating advantage to the motorists who burned the gasoline.

It has been estimated by some technologists in favor of widening the sulfur limit that the refiners of the country are put to an expense totalling $50,000,000 a year in meeting the .1 per cent requirement, which in their opinion was needless. However, not one of the proponents of a wider sulfur limit came forward with a paper at the symposium supporting the widening of the sulfur limit.

THE two papers presented were by H. C. Mougey, chief chemist of the General Motors Research Corp. and S. H. Diggs, chief chemist Standard of Indiana at Casper, Wyo.

Mr. Mougey's paper was entitled, "Sulfur in Gasoline from the Automobile Standpoint."

He stated that it has been estimated that if the sulfur limit were raised from .1 to .3 per cent, the refining industry would be saved $50,000,000 a year in treating costs. He pointed out, however, that the investment of the American public in automobiles is about $15,000,000,000 and expressed the view that it is hardly worth while to try and save 50 millions at the risk of damaging a 15-billion dollar investment.

Mr. Mougey went on to say that it is recognized that the cause of corrosion in automobiles is water formed in the combustion of the fuel and that the corrosive effect of this water is greatly increased if it is contaminated with acids resulting from the burning of the sulfur in the fuel.

He stated that his conclusions based on numerous tests carried out on many kinds of fuels at General Motors service stations all over the country, were that any increase in the sulfur limit would not be for the best interests of the public and of the automobile industry.

He stated that crankcase ventilators and control of jacket water temperatures by thermostats are factors which tend to decrease corrosion through minimizing the deposit of water in the crankcase and that in cars that are operated almost constantly, such as trucks, it is possible that fuels of higher sulfur content could be burned without damage. However, it is on cars whose service is only intermittent that the most serious corrosion troubles would be met with.

New Petroleum Division Officers

The following officers of the Petroleum Division of the American Chemical Society were elected at the Detroit meeting.

J. B. Hill Jr., Atlantic Refining Co., chairman.

Professor Fred W. Padgett, University of Oklahoma, vice chairman.

Carl Johnson, Manhattan Oil Co., secretary.

Executive Committee

C. O. Johns, Standard of New Jersey.

Ralph R. Matthews, Roxana Petroleum Co.

Mr. Digg's paper was entitled "A Study of the Effect of Sulfur in Gasoline On Wrist Pin Corrosion in Automobiles." The author stated that his paper was based on tests carried out in the winter of 1922-23 by himself and an engineer of the Continental Motor Co. in Detroit, using a Jordan engine fitted with new wrist pins, pistons and rings for each experiment.

The engine was run 1 hour and allowed to stand idle 1 hour. All the work was done when the thermometer was below freezing and was conducted out doors.

According to Mr. Diggs, each test represented from 60 to 75 hours running time. Results showed that when using a gasoline of .04 per cent sulfur there was no corrosion of wrist pins etc. and that the water condensed in the crankcase contained no free acid but did contain some $FeSO_4$. When using a gasoline of .151 per cent sulfur the corrosion was very appreciable and the water in the crank case contained sulfuric acid in small quantities. When using a gasoline of .458 per cent sulfur the corrosion was very serious and the crankcase water quite acid. The conclusion of Mr. Diggs was that an increase in the sulfur tolerance would be unsafe.

Mr. Zeitfuss, a chemist with the Standard of California, who was present at the meeting, stated that work carried out by his company had led them to the same conclusion as those formed by Mr. Mougey and Mr. Diggs.

Jacque C. Morrell, technologist of the Universal Oil Products Co., stated that in some restricted sections of the country, gasoline as high in sulfur as .5 per cent is being marketed with apparently no ill effects.

DR. MORRELL read a paper by W. F. Faragher, S. Comay and himself on "Thermal Decomposition of Sulfur Derivatives of Hydrocarbons,"

The authors stated in part:

"It is generally known that crude oil and its distillates containing compounds of sulfur produce hydrogen sulfide upon heating as, for example, during distillation.

"It is generally believed that the principal cause of corrosion in high-pressure stills is hydrogen sulfide. The sources of the corroding agent, hydrogen sulfide, have never been identified. The object of the present investigation is to study the thermal decomposition of organic sulfur com-

(*Continued on Page* 30)

Old Wells Store Excess Residue Gas In Burbank Field

By A. F. Hinton

TULSA, Sept. 10

TIDAL-OSAGE OIL CO., is one of four or five owners of gas leases in the Osage reservation of Oklahoma. Its gas domain consists of 187,000 acres, taking in the territory bounded by townships 26 to 29, inclusive, ranges 6 and 7. Gas and oil leases always have been sold separately in the Osage, the oil lessee having nothing to do with the gas rights. When it was originally decided to handle them in this way, by "gas" was meant dry or natural gas coming from wells not making oil. In the ensuing years, natural gasoline plants became plentiful, and violent argument arose as to ownership of the casinghead gas, from which gasoline was being extracted in the plants.

While this controversy is still going on to some extent, the matter is being handled amicably at present by an arrangement under which the oil lessee is presumed to own the gas until the gasoline has been extracted from it. After that extraction, he is entitled to enough of the residue gas to operate his properties, the remainder of the residue becoming the property of the company owning gas rights on the lease from which the casinghead gas originated.

The Osage Indian Agency at Pawhuska, which oversees oil and gas development on Osage lands, looks with much disapproval on waste of any kind of gas. Especially does it frown on blowing off residue gas, a practice frequently necessitated by lack of market. If residue gas is not being properly taken care of, the Agency will allow any company that can handle it satisfactorily to come in and take it, regardless of the fact that the gas lessee owns it. The theory is that, if the gas lessee wanted it very much, he would be taking care of it instead of allowing it to blow off. In addition to the economic waste occasioned by blowing off the gas, the Indians also lose their royalty if the gas is not being sold.

THE Tidal-Osage gas lease takes in the east side of the Burbank field, and includes nearly half of that field's area. Aside from the town of Shidler, an oil field town that grew up with the field, the Tidal does not supply gas to domestic consumers. Instead, its gas is sold to the Empire Gas & Fuel Co., an extensive gas operator in the Osage and dispenser of gas to a large number of cities in this territory.

During the past year, considerable new oil has been developed in the east part of Burbank, notably by the Kewanee Oil & Gas Co., Lewis Oil Co., Prairie Oil & Gas Co. and others. As gasoline plants have been built to take care of this new production, naturally there has been a considerable increase in residue gas available for the gas lessee. This increase having occurred in the summer, when demands for fuel gas are lowest, the Tidal-Osage now has about 3½ to 4 million cubic feet a day in excess of the 13 million feet being taken by the Empire.

TO TAKE care of this excess and to keep the gas until there is a market for it, the Tidal-Osage decided to store it in some of its partially depleted gas wells, having a gas field about 91 miles east of Burbank in which the wells are particularly well adapted for gas storage. By next December, it expects to have about 400 million cubic feet of gas stored in these wells.

To deliver the gas to the wells for storage, the company has built a booster station in the NW¼ of 34-27-6, a short distance from a temporary gasoline plant of the Sinclair Oil & Gas Co., from which it is getting the residue gas. Both the gasoline plant and the booster station are on an oil lease property of the Kewanee Oil & Gas Co. This is given here as an illustration of the workings of the Osage lease regulations. On the one quarter-section, one company is producing oil, another is buying casinghead gas and making gasoline, while still another is taking over the residue gas.

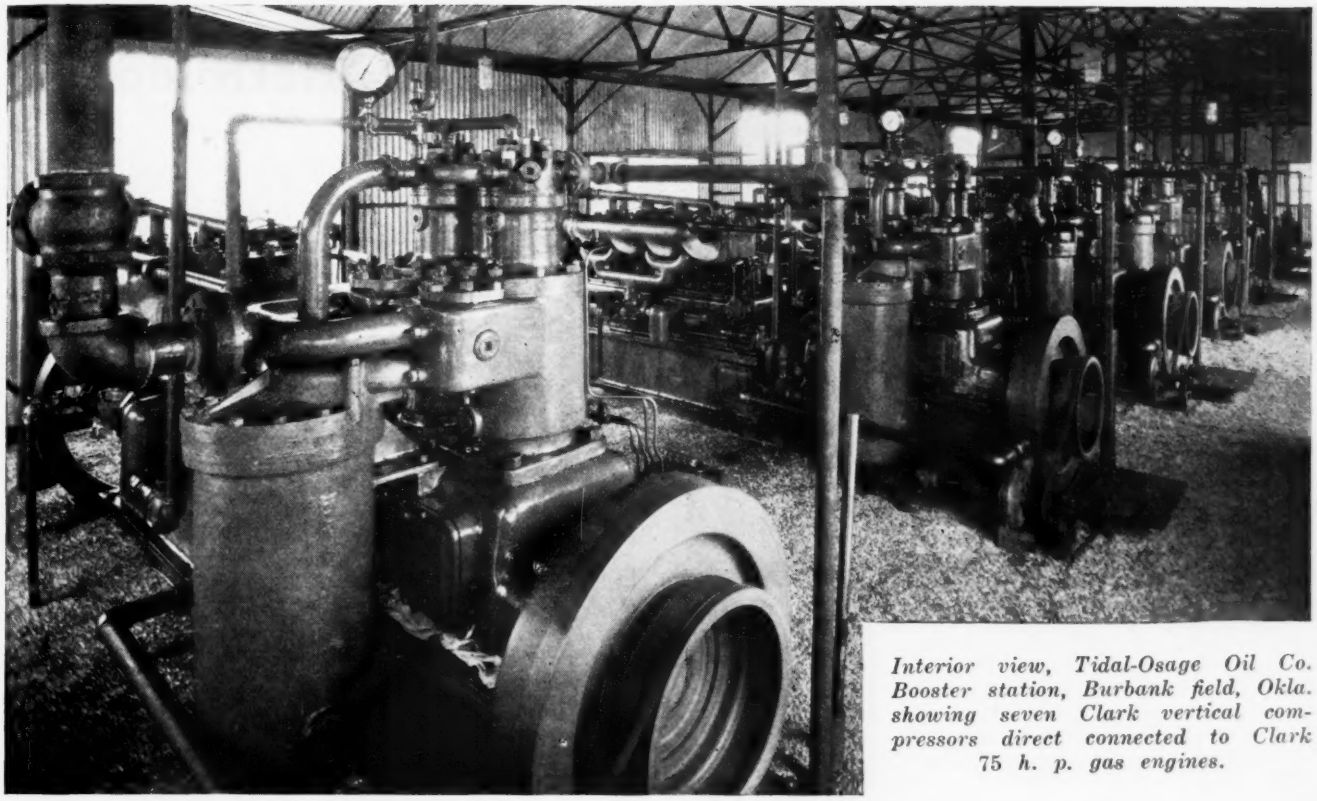
The new booster station consists of 7 new Clark Brothers vertical direct driven gas-engine compressors, and is the largest installation of these engines and compressors yet made in Oklahoma. The 75 h.p. gas engines, which are almost the same as the well-known Clark drilling engines, operate the compressors at 400 revolutions per minute, handling about 500,000 cubic feet of gas per unit per day. Gas is being taken from the gasoline plant from two scrubbers at different pressures; two of the Clark engines are working at three pounds intake pressure, while the other five have intake pressure of 15 pounds. The gas is discharged at about 300 pounds. The two-stage compressors are equipped with intercoolers. After leaving the high-pressure cylinders, gas then passes through an after-cooling coil outside the building, as is also shown in the exterior view.

Inasmuch as the present over-supply of residue gas probably will not last more than a few months, a permanent compressor station would have been prohibitive in cost, with its large building, concrete engine foundations and high expense in handling or moving the heavy machines. The vertical compressors being used are portable and can be easily disconnected and moved on short notice. Instead of concrete foundations, they rest on 16 x 16 timbers, buried in the ground. The engines are set down into these timbers, and are held in place by long wedge blocks driven in. To remove them from their bases, all that is necessary is to knock out the wedges. Engine and compressor together occupy floor space of 15 feet by 53 inches, and weigh 15,900 pounds, net.

Gas from the booster station passes through about 2,000 feet of 8-inch line into a 10-inch line running east. This line drops down to an 8-inch a short distance from this junction and continues of this diameter slightly more than eight miles to a connection with an Empire line, where Tidal gas is delivered to the Empire. This line originates at the main Tidal booster station, in the NW¼ of 4-26-6. This station, which is handling 13,000,000 cubic feet of gas daily, has 13-195 h. p. Cooper units. It also delivers gas to the Empire through an 8-inch line running north.

ON THE east-bound line, just before reaching the meter that measures the gas delivered to the Empire, a cut off is made and gas is diverted from the line to the storage wells. As nearly as posible, the same amount of gas pumped into the line by the new booster station is diverted at this point into the wells. Record is kept of total volume introduced into the wells, and pressure is regulated down to where it will go freely into the wells against existing rock pressure.

The five gas wells in which gas is being stored were drilled nearly six years ago by the Tidal. Three



Interior view, Tidal-Osage Oil Co. Booster station, Burbank field, Okla. showing seven Clark vertical compressors direct connected to Clark 75 h. p. gas engines.

of them are in 35-27-7 and two in 2-26-7. They are about 910 feet deep. The first wells drilled in this pool, in 1921, were oil wells. They drilled through the 910-foot gas sand, on the way to a 2200-foot oil sand, and blew large quantities of gas into the air before mudding it off. The first gas well drilled by the Tidal had rock pressure of 290 pounds. It was estimated by the company engineers that original rock pressure was about 350 pounds.

The gas wells were operated from January to December, 1922, gas being needed in development of Burbank. During that year they delivered 975,813,000 cubic feet of gas, with rock pressure 123 pounds at end of year. By calculations, the original volume in the sand at 290 pounds rock pressure was 1,777,000,000 cubic feet. The wells were shut in in December, 1922, and no gas was produced or returned to them until December, 1924. During the next two months, 135,000,000 cubic feet of gas was produced, with rock pressure in January, 1925, of 83 pounds.

The wells were again shut in until April 28, 1925, when excess residue gas from the field was returned to the sand until the following October. The following table shows the amounts of gas pumped into these wells during that period, with observed rock pressure:-

1925	Amount (1000 Cu.Ft.)	Rock Pressure
April	5,687	100
May	14,961	.....
June	31,497	112
July	38,182	120
August	29,619	122
September	29,750	128
October	8,309	128
Total	158,005	

From October, 1925 to July 26, 1927, the wells were shut in, with no gas produced or delivered. On the latter date, the new booster station started up and once more began pumping gas into the storage wells. Rock pressure at that time was 120 pounds, and is now nearly 140 pounds. The company estimates that, when 400 million cubic feet have been delivered into the wells, the rock pressure will be about 200 pounds. When this point has been reached, the wells will again be shut in and the gas held until there is a demand for it.

The shallow wells make ideal gas reservoirs. The sand is perfectly dry and there is practically no leakage, as is proved by the condition of the wells after standing shut in for two years at a time. All except one well have only one string of casing. The gas is introduced directly into the casing at the surface, but is not metered separately into each well.

Mr. Cole and Dudley Tyng of the Cole Petroleum Co., operating in the Laredo, Texas, district, have equipped a $4000 school in the Aviators field of Webb county to take care of the needs of children of oil workers. A similar school is being constructed by them in the Bruni field.

Kendall Enlarges Lube Plant at Bradford

Staff Special

BRADFORD, Pa., Sept. 9.—Kendall Refining Co., Bradford, is getting into operation its enlarged bright stock manufacturing facilities. The company's capacity with new equipment will be between 4,000 and 4,500 barrels of bright stocks a month, an officer of the company said.

The new equipment includes a 50-ton refrigeration machine to lower temperature of brine to 30° below zero, new chill and storage tanks, brine cooler, and six 10-ton percolator type filters. The wax plant also is being enlarged with another compressor and chiller.

A Nichols-Herreshoff clay burner has been installed this year and some clay was on its thirty-third burning this week. The improvements cost around $200,000.

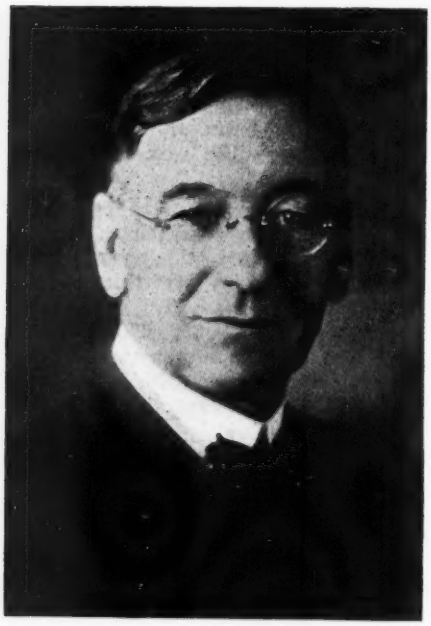
The Kendall company makes a No. 6 color bright stock with cold test of 16° F. and a neutral with cold test of 6° to 0° F.

Otto Koch is president and general manager of the company; Howard H. Greene, vice-president in charge of manufacturing, and I. H. Shearer in charge of sales. The company's motor oils have been marketed largely through the company's own stations in western New York state. The motor oils are branded Penz-Best.

National Petroleum Association Has Helped—

FAYETTE B. DOW
Washington counsel of the National Petroleum Association 1918-1926, and general counsel 1926 to date

FIFTEEN of the original 19 refining companies who organized the National Petroleum Association on June 17, 1902, are still in business and active members of the association, "eloquent testimony to the hardihood of the Appalachian refiners", Fayette B. Dow, general counsel of the organization, summed it up in his historical sketch of the association.



HERBERT G. EATON
Recording secretary of National Petroleum Association since its organization in 1902

This history was prepared for the association's twenty-fifth anniversary meeting at Atlantic City Sept. 14, 15 and 16 and was to be presented to members and their guests in an illustrated booklet.

The 19 member companies were: Warren Refining Co., Conewanga Refining Co., Empire Oil Works, Waverly Oil Works, Cornplanter Refining Co., Island Petroleum Co., Sterling Oil Works, A. D. Miller Sons Co., Emlenton Refining Co., Crystal Oil Works, Germania Refining Co., Tiona Refining Co., Levi Smith Refining Co., Titusville Oil Works, Superior Oil Works, Paragon Refining Co., Canfield Oil Co., Pittsburgh Oil Refining Co., and Crew Levick Co.

OF THE remaining four, Pittsburgh Oil Refining Co. has been merged with Waverley Oil Works and its association membership in that sense still retained; the plant of the Sterling Oil Works became the property of the National Refining Co., a member of the association, and the refinery of the Cornplanter Refining Co. was purchased by the Pure Oil Co., a member of the association. The Warren Refining Co. was a member until its plant was destroyed by fire about a year ago. The name of the Germania Refining Co. has been changed to Pennzoil Co.

Four of the six presidents of the association who have directed it through this turbulent 25 years in the history of the oil industry were to be present at this Atlantic City meeting. They are W. E. Wall,

W. E. WALL
A founder of the National Petroleum Association and its president from 1903 to 1912

Samuel Messer, William Muir, and O. P. Keeney who now holds that office. The two who have died are H. A. Jamison, the first president, and Col. U. G. Lyons. Herbert G. Eaton, another founder, has been recording secretary throughout the quarter century.

The history that Mr. Dow has prepared tells of events and men that have been in the foreground in this quarter-century span of the oil industry—the telling mellowed in the atmosphere of restrospection. While space does not allow the publishing of any great part of his work, some of the most pertinent bits are given herewith, in disjointed fashion. They

Oil Industry Pass Turbulent 25-Year Period

O. P. KEENEY
President of the National Petroleum Association, 1924 to date

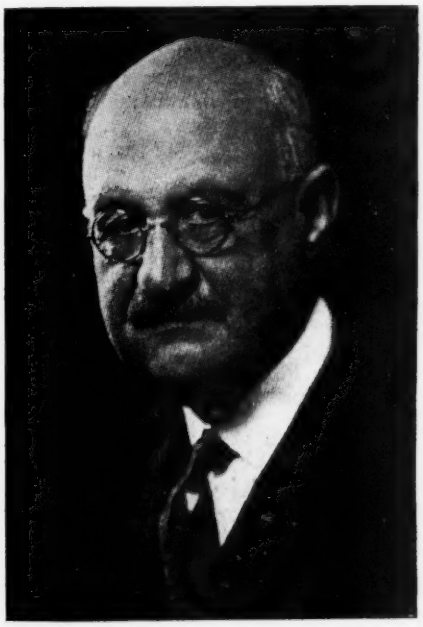
refer to the earlier days of the association, since many are familiar with this current activity.

* * *

The history of the National Petroleum Association is the story of the beginnings of successful cooperation in the oil industry.

* * *

The oil industry today is not yesterday's barefoot boy grown to manhood.



JUDGE C. D. CHAMBERLIN
Secretary of the National Petroleum Association from 1906 to 1917, general counsel from 1917 to 1926, and advisory counsel since 1926

It is not the enlargement of a picture taken with a pocket kodak. It is true that its growth has been marvelous, that the domestic production of crude oil is ten times and the dollars invested fifteen times greater than they were in 1902. But it serves public need that, if vastly greater, is radically different. It has been remade and revolutionized in its processes of production, manufacture and distribution until it bears little resemblance to the industry of twenty-five years ago. When one considers the changes that have taken place and the many adverse conditions with which they were confronted, it is remarkable that the present list of Association members contains so many names of the companies that established it.

The question is often heard: Can the smaller Appalachian refiners possibly survive? Predictions in the oil industry are always hazardous. But this may be said with certainty: They *have survived.*

* * *

The industry itself was in a period of transition (1902-1906). Its kerosene had filled the lamps of four decades. Electricity was replacing them. All of the automobiles in the United States, though destined later to revolutionize the industry barely equalled the registration of Erie, Pa., today. It was hard to find a market for gasoline even at a loss. Cylinder stocks showed no profit. Appalachian production of crude oil had declined, the Seaboard refiners wanted it and the price was high. Kerosene offered the only hope of profit and price cutting was destroying that hope. Economic conditions were chaotic. The independent refiners were not getting a new dollar back for an old one. Their situation was desperate and they knew that they were contributing to their own despair.

It is not surprising, therefore, that the subject of prices was one of the first to receive the consideration of the Association. Nor is it surprising that this effort of the Association, although successful for a time, should have ultimately resulted in failure.

* * *

The problem of crude oil supply was one of the matters to receive the

SAMUEL MESSER
President of the National Petroleum Association from 1917 to 1919

attention of the association soon after its organization. Through control of the pipe lines and the agency through which crude oil was purchased from the producers, the supply of Appalachian crude, available to the independent refiners, was largely controlled by the Standard Oil Co. A special meeting of the members of the Association which received their crude oil from the lines of the National Transit Co. was held at Warren on Nov. 30, 1903. The minutes record that "the chairman (Mr. Wall) reported at some length the details of the correspondence and conferences with representatives of the Standard Oil Co., which had been held with a view of securing an increased amount of crude for the different refiners, on account of the attitude of the Standard during October in cutting down the amount supplied to the different refiners 50 per cent.

* * *

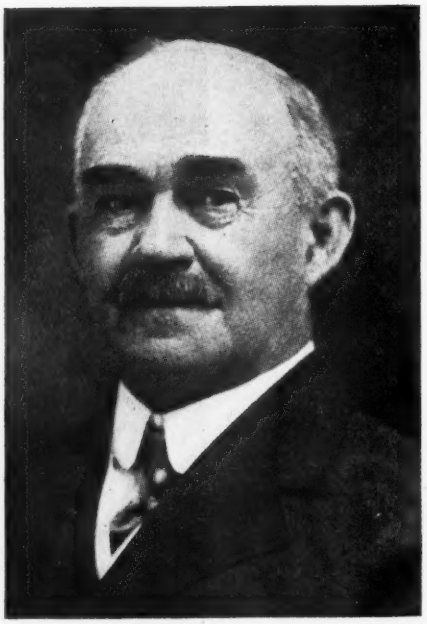
During this early period the minutes show that the members were bringing to the forum of the association for discussion many issues with which it was the proper function of the association to deal and in which it was later to play a leading and constructive part. Transportation had many vexatious problems, as we shall see, and a standing committee was apopinted to deal with it. Legislation, especially relating to the state inspection laws, required attention and that too was delegated to a committee. Rules of the Master Car Builders Association affecting repairs and changes in specifications of tank cars were discussed. Association standards of colors for various oils were adopted. But the effective conduct of the association's activities along such lines as these awaited the employment of a secretary and counsel.

* * *

As secretary and later general counsel, Mr. Chamberlin was to become one of the outstanding men in the early organized efforts of the oil industry. Although he began the practice of law in middle life, he became an effective lawyer and the soundness both of his character and judgment guided the association wisely during the two decades in which he was mainly responsible for its courses of action. Our written history does not record the date of his affectionate promotion to a judgeship but "Judge" Chamberlin he has been called for years and shall be so known in the pages of this book. A fair dealing man himself, he took up his tasks when fair dealing in business within the industry was one of the chief objects of the association.

* * *

It is essential to an understanding of this period of the association's history to state briefly the central issue which had prompted the employment of Judge Chamberlin and his associate, Mr. Boltz. That issue was equal opportunity in transportation. Rebates and drawbacks had been made unlawful by the Interstate Commerce Act, enacted in 1887, in so far as these practices resulted in unjust discriminations. As this law was construed by the courts it was not sufficient to show that a secret and preferential rate had been allowed in a particular case. There had to be further proof of higher charges paid by some other person on like and contemporaneous shipments. That is, it was necessary to prove discrimination in fact as between shippers entitled to the same rates by reason of receiving the same service.



WILLIAM MUIR
A founder of the National Petroleum Association and its president from 1912 to 1917

The facts thus developed, chiefly through the association's witnesses, were reported to Congress by the Commission on Jan. 28, 1907. This evidence was subsequently made a part of the record in the dissolution suit.

According to the minutes of a later meeting "the consensus of opinion seemed to be that the inspection laws in most states amounted to nothing more than a species of graft, and that under existing conditions no state inspection law was really necessary to protect its citizens." A resolution advocating their repeal was adopted. It was also charged that some of the laws were invalid under the police power because they were in effect revenue measures and the Association's counsel took part in a number of court cases in which their validity was tested.

Canfield Issues Handbook For Cleveland Motorists

CLEVELAND, Sept. 12.—An illustrated booklet giving traffic rules of Cleveland and surrounding cities and villages, with short editorials, has been issued in the fifth edition by the Canfield Oil Co. The booklet is entitled "In The Interest of Safe Driving."

The fifth edition brings the city traffic ordinances up to date. Various rules, as passing other cars, parking restrictions, stop boulevards are explained in detail.

Brief editorials give the requirements of good driving; telling motorists about registering and obtaining licenses, how to pass school houses, about brakes, eliminating hazards, how to make left and right hand turns, what to do in case of accidents and the latest traffic court etiquette.

Jay-walkers have a chapter devoted to them on crossing streets, and getting from safety zones to sidewalks. The door slammers kin, the horn blower, is censored in a chapter headed "Don't use your horn for a door bell."

An introduction was written by Charles McLean, vice president of the Canfield Oil Co., explaining the purpose of the booklet. Several pages in the rear tell of Canfield products, listing Cleveland service stations, with photographs of the Cleveland and Coraopolis, Pa. refineries. The booklet has 64 pages, and is pocket size.

A. P. I. Gas Committee Gathers Data

TULSA, Sept. 13.—The called meeting of The American Petroleum Institute committee on gas conservation, Sept. 12, at Colorado Springs, Colo., was devoted entirely to collection of information from voluntary contributors on the function of gas in oil production.

In a telegraph statement to the Tulsa office of National Petroleum News, E. W. Marland, chairman of the committee, said interesting opinions and actual experiences of operators in various fields were related which will be valuable in the final deliberations of the committee.

It is expected the committee will prepare a final report and submit it to the directors of the institute at the annual convention in Chicago in December. Originally this committee in resolution endorsed the principle of state legislation to conserve gas, and while this was discussed by the executive committee of the institute in May, no action was taken.

Low Price Brings Volume Sales Needed To Give Bulk Station Profit

By Roger B. Stafford

CLEVELAND, Sept. 12

WHAT is the psychology of the low price bulk station operator? What has brought him into the gasoline business and what does he think he will get from it? What are his principles of merchandising?

These questions may sound a bit academic but they are on the minds of every gasoline and oil marketer who in the last year or two has encountered low price bulk station competition.

Answers to the questions will vary because the opinions of men vary. Some of the new gasoline and oil merchants are really commercial drifters, seeking to earn a living and possibly a fortune where profits at the moment seem large. Others are more stable and believe they can make money by introducing new ideas in merchandising into an established business.

Both of these classes of men are to be found among the operators of the low price bulk stations. The former do not make much of an investment in plan and equipment. The latter class builds more for permanency.

The ideas of the latter class have been expressed well by B. D. Roseman who, as the Fairfax Oil Co., operates a low price station in Cleveland Heights, one of the residential suburbs of Cleveland. His principle of merchandising, he says, is, "Give the public good gasoline at a better price."

"To make a profit I have to have quantity," he added, "and to get the quantity I have to cut the price."

Roseman's station sells a 60-62 gravity 110 initial 425 or better end-point gasoline at 3 cents under the Standard's price of Red Crown. He buys his gasoline in tank cars at 12.75 cents delivered in Cleveland including the 3-cent state tax. This is equivalent to 6.05 cents a gallon, Group 3, but the gasoline is shipped from an Ohio refinery.

ROSEMAN'S station is miles from a railroad but he has contracted to have the gasoline hauled to his station for 0.75 cent a gallon. The dumps are all full truckloads as he has 6,000 gallons underground storage. He allows 0.25 cent a gallon for loss and shrinkage in handling.

This brings his total cost to 13.75 a gallon and his gross margin to 4.25 cents a gallon after allowing for handling losses and shrinkage.

B. D. Roseman, owner, handles the hose at his new Cleveland Heights, O., low price station, although he is well-to-do through other businesses. The fact that the owners are generally on the ground at these new low price stations is one big reason for their success

The cost of getting the gasoline from his underground tank into a customer's car varies with the volume of business done, in other words the rate of turnover. Here again comes Roseman's philosophy of merchandising, "To make a profit I have to have quantity and to get quantity I have to cut the price."

ROSEMAN after operating several weeks said he was making a profit out of his gasoline sales. He was building a chassis lubricating and crankcase business as well. He had had plans made for a superstation and after selling 4500 gallons of gasoline July 2, his opening day and in the two days following, he pushed ahead construction of a large station. This will soon be ready for operation. It contains a car repair garage, car laundry, battery and tire shops and enclosed three-pit oiling and greasing rack.

Roseman says he will maintain low but profitable prices in all other departments of the station. An example of his oiling and greasing prices, the charge for draining and refilling the crankcase of a light six car with six quarts of a 30-cent oil, transmission and differential housings cleaned and refilled, chassis greased, and springs sprayed was $3. This was 50 to 60 cents cheaper than the prevailing Cleveland prices for this job.

BUT what sort of a man is Roseman? True, he has been somewhat of a business nomad. He is one of the type that can take a licking without weeping. If he loses at one thing he will make another pay. He was in the tea and coffee business and built it to a point where he had 40 salesmen on the road. He lost a fortune in sugar in 1920 but simul-

taneously earned a handsome profit in spices.

He tried real estate, and acting also as a motgage broker went into the second mortgage business. He put profits into real estate and acquired several large plots in Cleveland Heights that were zoned for residence purposes but since have been placed in business zones. It is on one of these plots at Taylor and Superior roads, that Roseman looking about for some means of income until the district warranted erection of business blocks, decided to put in a gasoline station. So Roseman built a station and he says with a 3-cent narrower margin than the posted service station price of the Standard Oil Co. would give, he is making a profit. He caters only to the passenger car trade. He has made no effort, he said, to go after commercial business. His nearest competitor is almost a mile away. His station is in a developing residential neighborhood with business permitted on only one street. Therefore there is little commercial and no industrial trade available to Roseman's station. Commercial trade usually means credit business and Roseman does no credit business, he says. He takes the fact that he will suffer no losses from bad accounts into consideration when he sets the price at which he sells gasoline.

"One man's dollar is as good as another's, so why give one man preference?" Roseman asks in explaining his position about the commercial trade.

ROSEMAN spends considerable time at the station getting acquainted with the gasoline trade. He wears khaki jumpers and is usually taken for a middle-aged attendant by the customers who are not acquainted with him. He is there every morning while the stucco and tile buildings of the superstation are being built, and many of the evenings. He also spends most of his Sundays there filling in for one of the regular salesmen who are given the day off.

When Roseman opened the station one of the most frequently asked questions was, "What kind of gasoline is this?"

"It's the same as other good gasoline except the difference of 3 cents," he always answered. The 3 cents was the difference in price between his price and that charged at other stations in Cleveland Heights and in Cleveland excepting the stations with tank car storage and the curb pumps.

Roseman plans to put in another station about two blocks down the street but on the opposite side. That station is expected to get cars that now must pass through oppositely bound traffic to enter his station. If these stations pay well, Roseman said he would put in a chain of stations about Cleveland, perhaps 50. He does not have a bulk station but leases storage space from the operator of another bulk storage filling station that lies adjacent to a railroad. This saves him considerable overhead and permitted him to figure his operating cost ahead of his opening business.

Roseman employs five men at the filling station, two on each shift at the pumps and one on the oil and grease racks. He said he planned to put only one man in the garage and one in each of the battery and tire shops.

Tests Show Danger in Wider Sulphur Limit

(*Continued from page* 23)

pounds and to relate the results to the changes which take place during the refining and cracking of oil.

"The following organic sulfur compounds were selected as representative of these types which are considered to be present in petroleum; mercaptans, alkyl sulfides, alkyl disulfides, thiophene, and elementary sulfur. All these substances were dissolved in naptha made from Pennsylvania crude oil. The vaporized solutions were subjected to an average temperature of 925 degrees Fahr. The products of the termal decomposition were identified. The results obtained follow:

"(1) Isoamyl mercaptan produced hydrogen sulfide and elementary sulfur as well as a tarry residue.

(2) Isoamyl sulfide produced hydrogen sulfide, isoamyl mercaptan, and a thiophene-like product, probably an alkyl derivative of thiophene. Gaseous products of the methane and ethylene series were produced as well as a tarry residue.

(3) Isoamyl disulfide gave the following products: Hydrogen sulfide, elementary sulfur, diethyl sulfide, thiophene, gaseous hydrocarbons of the methane and ethylene series, and a highly-polymerized tarry residue. Hydrogen in small quantity was found.

(4) Norman propyl disulfide produced all the corresponding compounds enumerated in (3) and in addition yielded a solid crystalline substance, red in color and of high boiling-point. This new compound had a sharp melting point and work is at present in progress on its identification.

(5) Ethyl sulfide gave ethyl mercaptan and hydrogen sulfide. No thiophene was formed. A highly polymerized tarry residue was produced in addition to gaseous hydrocarbons.

(6) Ethyl disulfide produced the same kinds of decomposition as isoamyl disulfide.

(7) Thiophene underwent no decomposition even at 1800 degrees Fahr.

(8) Elementary sulfur in naptha solution gave hydrogen sulfide only.

The stability of thiophene suggests the reason why certain crude oils or fractions, while high in sulfur content, cause less corrosion during the cracking operation than other types of a much smaller content of sulfur. Smackover crude containing 2.5 per cent of sulfur shows less corrosion during the cracking operation than Panhandle crude containing 0.6 per cent of sulfur."

F. H. Morris of the Standard of Indiana read a paper by himself and Walter G. Whitman of the same company on "Heat Transfer for Oils and Water in Pipes." Following is an abstract of this paper:

"Film coefficients of heat transfer have been determined for three petroleum oils and for water flowing through the tube of a double pipe heat exchanger. The experiments cover both heating with steam and cooling with water under similar conditions.

The flow was in the turbulent or semi-turbulent regimes. Linear velocity varied from 1 to 20 feet per second, viscosity ran from 0.5 to 55 centipoises and the heat transfer coefficients on oil covered a range from 10 to 700 B.t.u. per hr. per sq. ft. per degrees Fahr.

"The data for oils and water can be correlated on the basis of Boussinesq's theoretical equation, which states that the heat transfer coefficient is a function of the velocity, viscosity, density, thermal conductivity, specific heat, and pipe diameter, arranged in diamensionless groups. The quantitative conclusions are expressed graphically since no simple equation has been found which will apply over the whole experimental range.

"Physical properties of the liquid are taken preferably at the temperature of the main body of the liquid rather than at the customary film temperature. On this basis the cooling coefficients fall about 20 per cent lower than those for heating.

The results from heating water with steam agree closely with those published by other investigations. Data on the other cases are not available for comparison."

Maine Dealers Meet Sept. 14

QUINCY, Mass., Sept. 13.—A meeting of the newly organized Maine Independent Oil Dealers Association will be held at Gardiner, Me. on Sept. 14.

Fred E. Bergfors, secretary-treasurer of the Quincy Oil Co. here, and past president of the Independent Oil Men's Association of New England, will address the Maine jobbers.

A $25,000 sale 15 *minutes* after deciding to call

THE OFFICIALS of a metal specialties company in Plano, Illinois, were discussing an interview that should be made at once in New York. Prospects were fair for making the sale. But the men were unusually busy . . . how could they spare the time to go and return? They decided to telephone. Within 15 minutes the sale was consummated. The amount involved was $25,000.

"THIS METHOD OF SECURING the sale," writes the treasurer of the company, "represented several hundred dollars additional profit to us."

Such is the every-day work of Long Distance for men who are busy. The long lines reach from each office to any other, from Canada to Cuba to England. The continent or any chosen area is the field of action for the man who travels by telephone. Long distance calls accomplish in minutes what otherwise might take weeks or days. They result in growth to the individual and to the business. They slash expense. They mean efficiency with comfort.

What far-away transactions could you close now—without leaving the office? You'll be surprised how little the calls will cost. . . . . *Number, please?*

BELL LONG DISTANCE SERVICE

Day to Day History of World Flight

Aug. 27-28—Harbor Grace, Newfoundland, to London; 2,350 miles.
Aug. 29.—London to Munich, Germany; 580 miles.
Aug. 30.—Munich to Belgrade, Yugoslavia; 610 miles.
Aug. 31.—Belgrade to Stamboul (Constantinople), Turkey; 500 miles.
Sept. 1—Delayed while getting clearance permission from Turkish government.
Sept. 2.—Stamboul to Bagdad, Iraq; 1,075 miles.
Sept. 3.—Bagdad to Bender Abbas, Persia, 885 miles.
Sept. 4.—Bender Abbas, to Karachi, India; 710 miles.
Sept. 5.—Karachi to Allahabad, India; 925 miles.
Sept. 6.—Allahabad to Calcutta, India; 485 miles.
Sept. 7.—Calcutta to Rangoon, Burma; 665 miles.
Sept. 8.—Rangoon to Hanoi, French Indo-China; 1,000 miles.
Sept. 9.—Hanoi to Hongkong, China; 600 miles.
Sept. 10.—Hongkong to Shanghai, China; 780 miles.
Sept. 11.—Shanghai to Omura, Japan; 530 miles.
Total mileage covered, 11,695.
Total flying time, 137 hours.

Cities and distances to be covered after Sept. 12 were as follows:

From Omura to	Miles
Tokio, Japan	600
To Sand island, Midway group	2,480
Honolulu, Hawaii	1,440
San Francisco	2,400
Cheyene, Wyo.	925
Chicago	865
Detroit	257
Harbor Grace	1,550
Total to go after Sept. 7	10,517
Total mileage of flight	22,212

On Sept. 11 Edward F. Schlee and William S. Brock had reached Omura, Japan, 600 miles southwest of Tokio on their attempt to beat by airplane the world encircling record of 28½ days

World Flyers Pass Half Way Mark

CLEVELAND, Sept. 13

UNTIL today the world flyers, Edward F. Schlee, Detroit oil man, and his pilot, William S. Brock, had covered in their monoplane, the Pride of Detroit, little more than half the distance around the world, but with the hardest part of the flight ahead of them.

There is doubt, according to dispatches from Japan, that the Pride of Detroit will be able to attempt the 2480-mile hop from Tokio to Sand Island of the Midway islands because of the non-arrival of their gasoline and oil supply at Sand Island and difficulty that may be experienced in getting sufficient gasoline off the ground at Tokio to propel them to the little group of islands in mid-Pacific.

Sunday, Sept. 11 the flyers for the first time since they left Harbor Grace, Newfoundland, Aug. 27 failed to reach their objective, Tokio. They landed at Omura near Nagasaki on the island of Kyushu, 600 miles southwest of Tokio, after encountering a storm which made them deem it advisable to turn back to the naval airdrome at Omura. They had already flown more than 100 miles beyond their landing point.

The storm was encountered, according to press dispatches, when they were over the province of Miyazak on the eastern coast of Kyushu. When they reached Bungo channel, the narrow strait that separates Kyushu and Shikoku, the two large islands southwest of Nippon, they were unable to see across. They then decided to land at Tachiari rather than attempt a blind passage but as their gasoline supply was running low because of the struggle with the storm they turned to the naval airdrome at Omura.

Sept. 12 they again hopped off for Tokio but were forced to return because of another storm.

FROM Rangoon, Burma, the Detroit men flew to Hanoi, French Indo-China, Sept. 8; to Hongkong the next day, to Shanghai, China, Sept. 10, and the attempt for Tokio was made Sept. 11.

The fliers caused some anxiety Sept. 8 when they left some doubt as to their destiny, either Bangkok, Siam, or Hanoi. When they failed to reach Bangkok at the expected time, it was feared something may have happened to them or their monoplane. However, they had only continued to Hanoi.

The following day they went to Hongkong, almost surprising the American consul who had not expected them so soon and did not know they were en route to that city until notified by a press service. They encountered rain and stiff headwinds on that leg.

FRIENDS and relatives of the two men are entreating them not to attempt the flight to the Midway islands. Now that there may be difficulty about a gasoline supply, it is conjectured that the Detroiters may take a ship to some island in the Pacific within hopping distance of Honolulu, and complete their journey by air. The U. S. Navy has refused to string cruisers along the lane from Tokio to the Midway group.

They are still ahead of the around-the-world record of 28½ days made last year by Edward S. Evans and Linton Wells.

Mr. Schlee is head of the Wayco Oil Corp., distributors in Detroit of Shell gasoline and Valvoline motor oils. The monoplane Pride of Detroit is the craft with which he won the National Air Tour earlier in the summer. The ship was then named Miss Wayco.

They Supply the Need for *Better* Auto-Filling Faucets

FILLING station men—and automobilists—have expressed the need for better auto-filling faucets. Well, here they are—two *full-size, full-flow, self-closing, non-leaking* Wheaton Faucets—developed to supply that need!

Type 50, shown at the right, has operating advantages that are unequalled—and they're obvious at a glance. Many filling stations have adopted Type 50 as *standard equipment* because they consider it the *best* auto-filling faucet money can buy. Type 41, illustrated below, is a new arrival in the Wheaton family—and is worthy of kinship with the better-known Type 50. Both faucets are of Wheaton Quality *throughout.* They are made of a special-analysis brass alloy—tempered, toughened and tested—the same high-grade, non-corrosive material that is found in all Wheaton Faucets and Valves. And the disc furnished in these nozzles is made of the same special composition used for the past fifteen years in the famous Wheaton Type A Tank Truck Faucet.

Read the descriptions under the illustrations—then send for samples. Give them your own test. If they do not prove entirely satisfactory, you may return them for full credit or refund.

Wheaton Type 50 Auto-Filling Faucet

Approved by Underwriters' Laboratories

The above photograph shows the Wheaton Type 50 Auto-Filling Faucet. The valve opens with the *easy pull* of the trigger and *automatically closes* with its *release.* The trigger *guard* protects the trigger from accidental pressure, and also protects the stuffing box and plunger. The curved brass spout is easily and cheaply renewed—a splendid feature because the spout is the part subjected to most abuse—and it is available in any desired length. Sizes: 1 and 1¼-inches.

Wheaton Type 41 Auto-Filling Faucet

The new Wheaton Type 41 Auto-Filling Faucet is illustrated above. Its operation is easy; its action is smooth. And it is self-closing—the instant pressure on the handle is released it *closes tight.* This prevents waste. The washer is quickly and easily replaced by simply removing the bonnet. The spout, too, is easily and cheaply renewed, and may be obtained in any length. The hook on the body of Type 41 is an added convenience in hanging up the hose when not in use. Sizes: 1 and 1¼-inches.

A. W. WHEATON BRASS WORKS
NEWARK, NEW JERSEY

Wheaton

FAUCETS · VALVES · JOINTS · COUPLINGS · FILLERS · NOZZLES · FITTINGS

Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

Mid-Continent Refinery Operations Week Ended September 9 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	North La.-Ark.	Total Week Ended Sept. 9	Total Week Ended Aug. 12
Plants Reporting	23	46	41	14	124	124
Crude Capacity (bbls.)	106,200	165,900	144,300	53,700	470,100	470,100
Cracking Capacity	29,000	45,800	15,750	20,200	110,750	110,750
Da. Av. Crude Runs	56,829 + 3.6	115,502 + 0.8	61,958 — 2.0	45,586 — 6.9	279,875 — 1.7	298,512
Da. Av. Other Oils	4,932 — 18.6	4,423 +479.3	6,946 — 29.4	843 — 45.6	17,144 — 5.7	12,125
GASOLINE—Gallons						
Stocks, Sept. 2	9,158,000	37,334,000	15,364,000	2,520,000	64,376,000	69,639,000
Prod. 9-2 to 9-9	8,487,000 — 7.5	18,467,000 + 10.1	7,392,000 — 2.9	3,632,000 — 17.5	37,978,000 + 0.1	39,576,000
Ship. 9-2 to 9-9	10,533,000 + 4.8	19,704,000 — 2.9	7,801,000 — 2.6	3,858,000 — 24.9	41,896,000 — 3.1	38,707,000
Stocks, Sept. 9	7,112,000 — 22.4	36,117,000 — 3.3	14,955,000 — 2.7	2,294,000 — 9.0	60,478,000 — 6.1	70,508,000
Ratio Sales to Prod.	124.1%	106.6%	105.5%	106.2%	110.2%	97.8%
KEROSENE—Gallons						
Stocks, Sept. 2	4,016,000	4,099,000	1,754,000	467,000	10,336,000	12,673,000
Prod. 9-2 to 9-9	1,450,000 + 1.5	3,110,000 + 10.0	1,445,000 + 17.4	475,000 — 1.1	6,480,000 + 8.6	6,607,000
Ship. 9-2 to 9-9	1,818,000 + 27.2	3,040,000 — 0.04	1,277,000 — 20.1	523,000 — 6.4	6,658,000 + 0.5	7,071,000
Stocks, Sept. 9	3,648,000 — 9.2	4,169,000 + 1.7	1,921,000 + 9.5	419,000 — 10.3	10,157,000 — 1.7	12,209,000
Ratio Sales to Prod.	125.4%	97.7%	88.4%	110.1%	102.7%	107.0%
STOVE DISTILLATE—Gallons						
Stocks, Sept. 2	4,761,000	6,347,000	2,042,000	26,000	13,176,000	9,079,000
Prod. 9-2 to 9-9	462,000 + 0.2	796,000 — 14.2	370,000 + 8.5	71,000 + 12.7	1,699,000 — 5.2	2,788,000
Ship. 9-2 to 9-9	402,000 + 40.1	491,000 — 15.2	250,000 + 30.2	25,000 — 69.2	1,168,000 + 2.5	721,000
Stocks, Sept. 9	4,821,000 + 1.3	6,652,000 + 4.8	2,162,000 + 5.9	72,000 +176.9	13,707,000 + 4.0	11,146,000
Ratio Sales to Prod.	87.0%	61.7%	67.6%	35.2%	68.7%	25.9%
GAS OIL—Gallons						
Stocks, Sept. 2	9,830,000	38,433,000	16,547,000	9,835,000	74,645,000	70,389,000
Prod. 9-2 to 9-9	1,881,000 — 1.6	2,375,000 +105.4	1,250,000 — 44.4	1,809,000 + 2.3	7,315,000 + 3.3	5,886,000
Ship. 9-2 to 9-9	2,030,000 + 7.5	635,000 — 54.4	1,039,000 — 47.0	1,185,000 — 41.5	4,889,000 — 32.4	4,250,000
Stocks, Sept. 9	9,681,000 — 1.5	40,173,000 + 4.5	16,758,000 + 1.3	10,459,000 + 6.3	77,071,000 + 3.3	72,025,000
Ratio Sales to Prod.	107.9%	26.7%	83.1%	65.5%	66.8%	72.2%
FUEL OIL—Gallons						
Stocks, Sept. 2	12,578,000	43,372,000	33,697,000	9,657,000	99,304,000	92,216,000
Prod. 9-2 to 9-9	5,762,000 — 3.4	7,838,000 — 4.2	8,023,000 — 0.1	6,816,000 + 5.9	28,439,000 — 0.6	30,340,000
Ship. 9-2 to 9-9	5,053,000 — 22.5	7,055,000 — 0.6	9,102,000 + 30.4	7,204,000 — 5.6	28,414,000 + 0.7	25,455,000
Stocks, Sept. 9	13,287,000 + 5.6	44,155,000 + 1.8	32,618,000 — 3.2	9,309,000 — 4.1	99,369,000 + 0.03	97,101,000
Ratio Sales to Prod.	87.7%	90.0%	113.4%	105.7%	99.9%	83.9%

Gasoline Produced by Various Methods, Week Ended September 9

	Kansas	% of Total	Oklahoma	% of Total	Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	5,686,000	67.0	12,556,000	67.9	5,770,000	18.1	1,273,000	35.0	25,285,000	66.5
Cracked	2,319,000	27.3	4,428,000	24.0	1,252,000	16.9	1,875,000	51.6	9,874,000	26.0
Natural	482,000	5.7	1,503,000	8.1	370,000	5.0	484,000	13.4	2,839,000	7.5
Total	8,487,000		18,487,000		7,392,000		3,632,000		37,998,000	

+ or — columns are changes over previous week.

Gasoline Shipments Are Next to Year's High Mark

Staff Special by Telegraph
TULSA, Sept. 13

GASOLINE shipments from 124 Mid-Continent refineries were 41,896,000 gallons in the week ended Sept. 9. This was only 1,500,000 gallons less than the record established in the week ended Sept. 2, and also the second highest total this year. The third highest mark was made in the week ended July 29 when the total was 40,700,000 gallons.

Gasoline production was virtually unchanged at 37,998,000 gallons and the heavy shipments therefore caused a draft on gasoline stocks of 3,900,000 gallons, only 1,000,000 short of the total for the preceding week.

Shipments both in anticipation of Labor day consumption and at least

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Sept. 9. Change in stocks figures from Aug. 12.

GASOLINE

	Gallons
Production	152,209,000
Shipments	162,239,000
Net change in stocks	—10,030,000
Ratio sales to production	106.5%

KEROSENE

Production	25,359,000
Shipments	27,411,000
Net change in stocks	—2,052,000
Ratio sales to production	108.1%

STOVE DISTILLATE

Production	6,706,000
Shipments	4,147,000
Net change in stocks	+2,561,000
Ratio sales to production	61.8%

GAS OIL

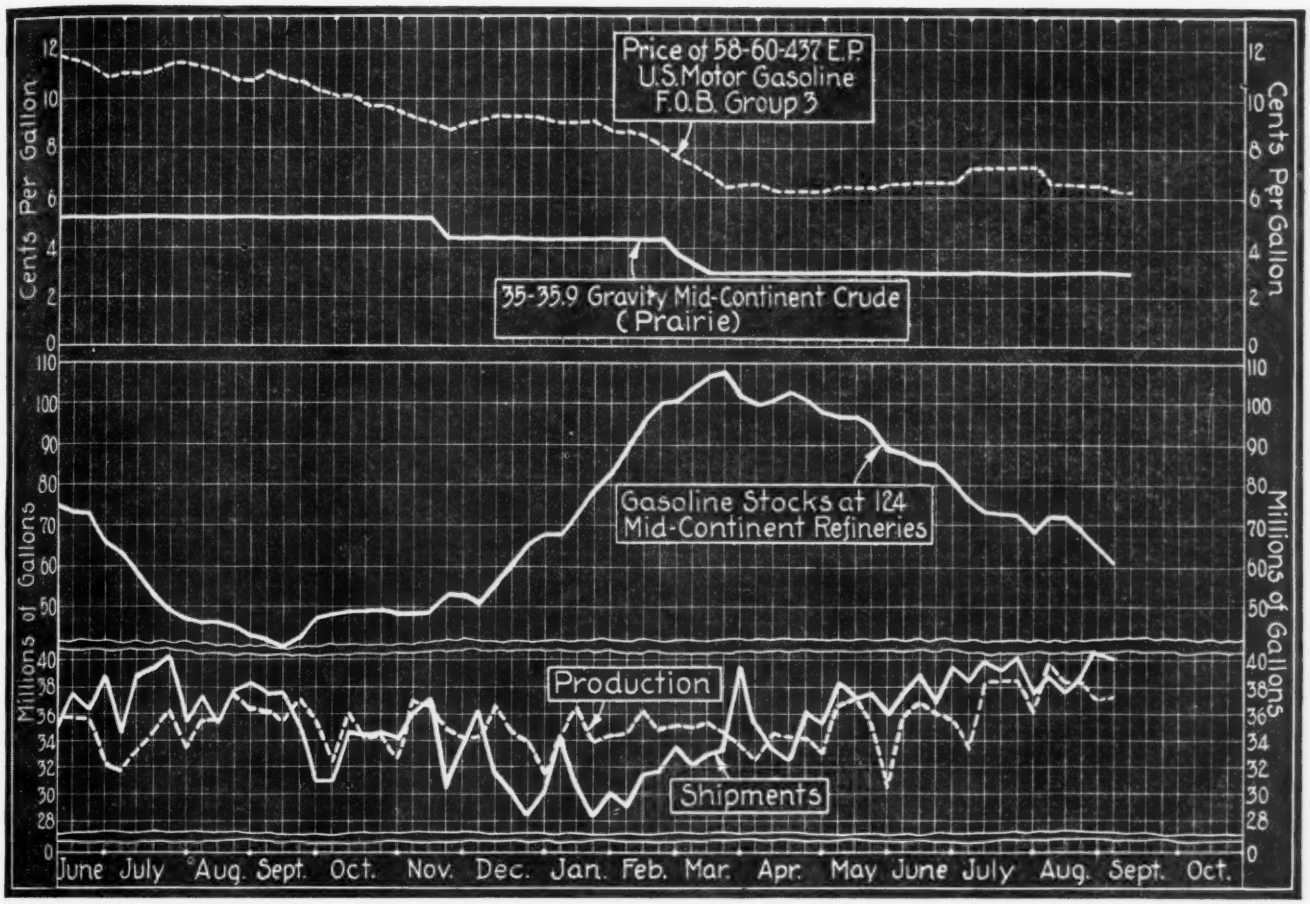
Production	27,964,000
Shipments	22,918,000
Net change in stocks	5,046,000
Ratio sales to production	81.9%

FUEL OIL

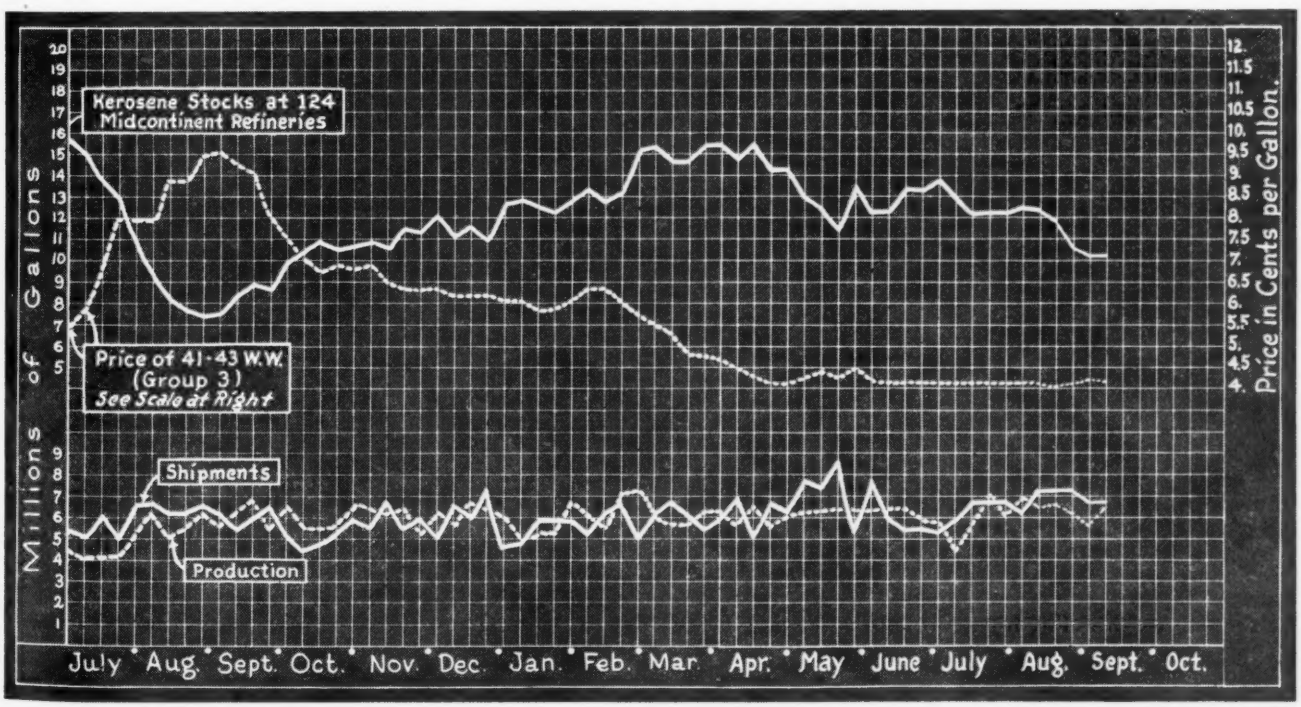
Production	115,253,000
Shipments	112,985,000
Net change in stocks	+2,268,000
Ratio sales to production	98.0%

Barometer of Mid-Continent Refinery Market—Week Ending September 9

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News

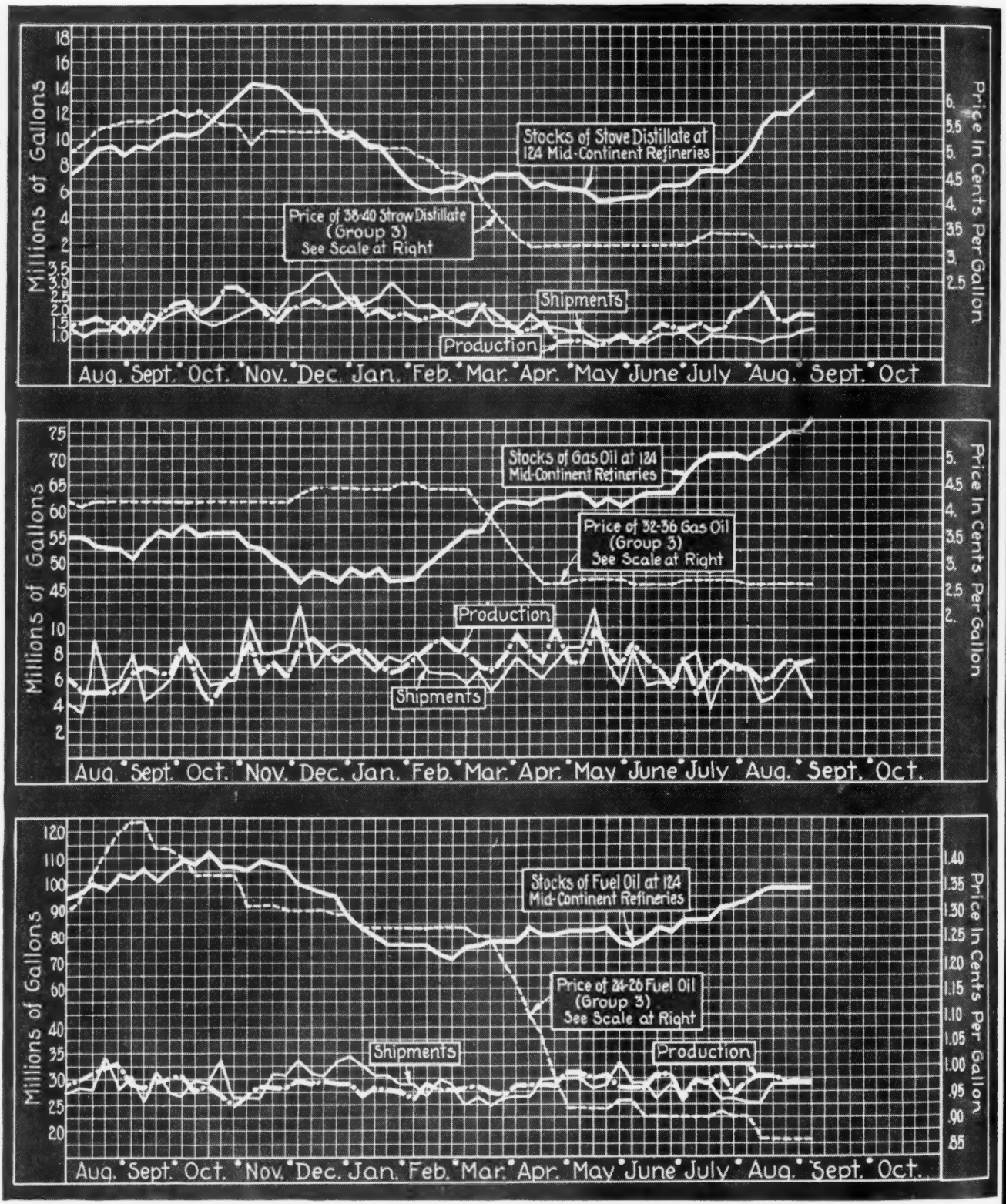

Price of 58-60-437 E.P. U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude (Prairie)
Cents Per Gallon
Gasoline Stocks at 124 Mid-Continent Refineries
Production
Shipments
Millions of Gallons
June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date shown in table on opposite page


Kerosene Stocks at 124 Midcontinent Refineries
Price of 41-43 W.W. (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Cents per Gallon.
July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.

Barometer of the Mid-Continent Refinery Market—Week Ending Sept. 9, 1927

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News

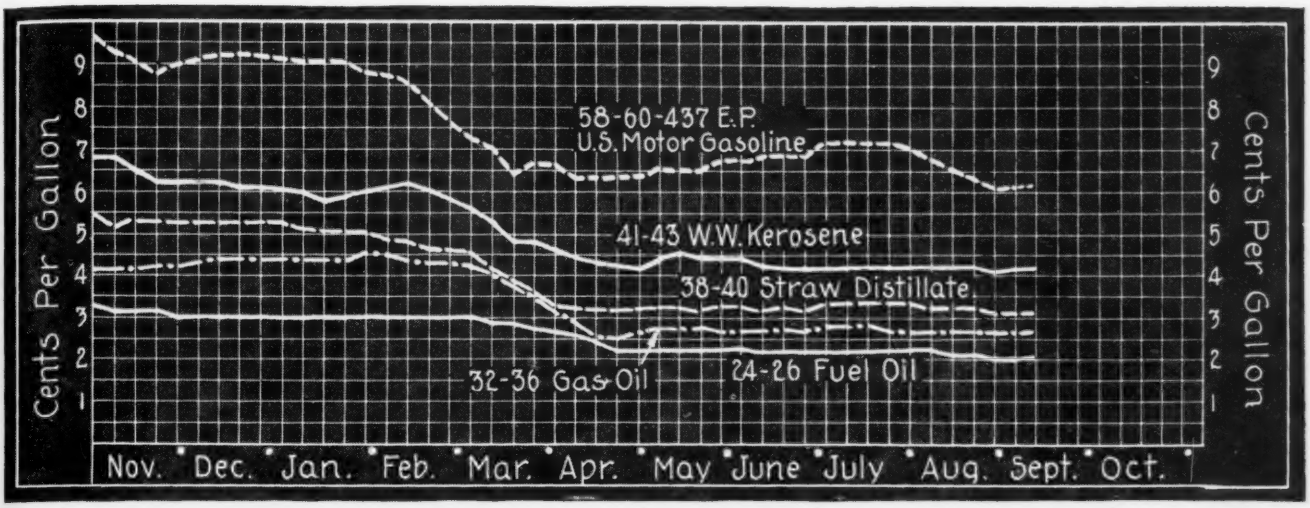

Millions of Gallons
Price In Cents Per Gallon
Stocks of Stove Distillate at 124 Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) See Scale at Right
Shipments
Production
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct
Millions of Gallons
Price In Cents Per Gallon
Stocks of Gas Oil at 124 Mid-Continent Refineries
Price of 32-36 Gas Oil (Group 3) See Scale at Right
Production
Shipments
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.
Millions of Gallons
Price In Cents Per Gallon
Stocks of Fuel Oil at 124 Mid-Continent Refineries
Price of 24-26 Fuel Oil (Group 3) See Scale at Right
Shipments
Production
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.

partly to augment the more than anticipated consumption have been sufficient the last two weeks to cause a draft on stocks in the four weeks ended Sept. 9 of 10,000,000 gallons. That the increased gasoline business has been general is indicated by the fact that all districts in the Mid-Continent shared in the reduction in stocks. Kansas refiners had a ration of sales to production of 124.1 while the other areas ranged from 105.5 to 106.6.

Crude runs were reduced 5800 barrels daily average to 279,875 barrels daily. Charges of other oils were reduced approximately 1000 barrels daily average. All fields but Oklahoma reduced both crude and other oils charges. Oklahoma refiners increased their runs approximately 1000 barrels. Charges of other oils were increased approximately 3,500 barrels.

Kerosene production was increased almost 500,000 gallons and shipments

Current Prices of Principal Mid-Continent Refined Products


Cents Per Gallon
Cents Per Gallon
58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
38-40 Straw Distillate
32-36 Gas Oil
24-26 Fuel Oil
Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.

Prices shown above are on Group 3 basis and extended to date shown in Refinery Market Tables in Market Section of this Issue

were virtually unchanged. Stocks were reduced approximately 170,000 gallons. Kansas and Louisiana-Arkansas refiners got enough business to offset the increases in stocks at Oklahoma and Texas refineries. In the four weeks kerosene stocks were reduced 2,052,000 gallons. Stocks on hand Sept. 9 were 10,157,000 gallons, approximately 2,000,000 gallons more than stocks a year ago.

Distillate shipments have been slower because of mild weather in consuming territory. Refiners increased stocks approximately 500,000 gallons last week. Shipments and production were virtually unchanged. Gas oil production showed little change but shipments fell off considerably to 4,889,000 gallons, causing an increase in stocks of approximately 2,400,000 gallons.

Fuel oil production and shipments were 28,439,000 and 28,414,000 gallons, respectively, stocks being increased only 25,000 gallons.

Standard of California Advertise New Oil

Staff Special

LOS ANGELES, Sept. 10.—Standard Oil Co. of California announced through page advertisements in practically all of the larger California daily newspapers Sept. 8 a new lubricant, to be known as the New Zerolene, setting forth claims that it "stands up," that it forms no hard carbon and does not "thin out." The advertisement says "When the crankcase is drained it is still 'live' and 'oily.' "

Practically every service station on the west coast, other than those owned and operated by the Pan American, offers for sale to the automobile owner, both Eastern and Western lubricants, and one authority recently estimated that fully 30 per cent of the lubricants sold on the West Coast for use in motor cars is of eastern manufacture. The Pan American has contended that western lubricants, manufactured at its own refinery, are good enough for any car, and refuses to offer for sale any eastern goods.

The Standard says in its advertisements: "This new lubricant is the latest achievement in petroleum products of the company's research laboratories. For more than two years company experts have striven to produce a new and better lubricant for motor cars, particularly an oil to meet the requirements of the present-day automotive engine. The experts succeeded, and have created a modern oil for modern motor cars."

The new lubricant is made in three grades of bodies: No. 3, No. 5 and No. 7 Zerolene "F", manufactured especially for Fords, remains unchanged.

Ft. Wayne Wins Contest, Gets Picnic

CHICAGO, Sept. 10.—Fort Wayne service station attendants of Standard Oil Company of Indiana collected a two day picnic from South Bend service station attendants, Aug. 17 and 18, because the Fort Wayne men outsold their South Bend rivals almost two to one in a prize sales contest in July.

When the final figures were in the 19 service stations in Fort Wayne had sold almost twice as many cans of motor oil as the 22 service stations in South Bend. There had been much talk and correspondence between the heads of the two groups of service stations and out of it came the bet that the loser would pay for a picnic at Lake Tippecanoe. F. W. Asay, superintendent of service stations at Fort Wayne, reports that his men had an enjoyable time.

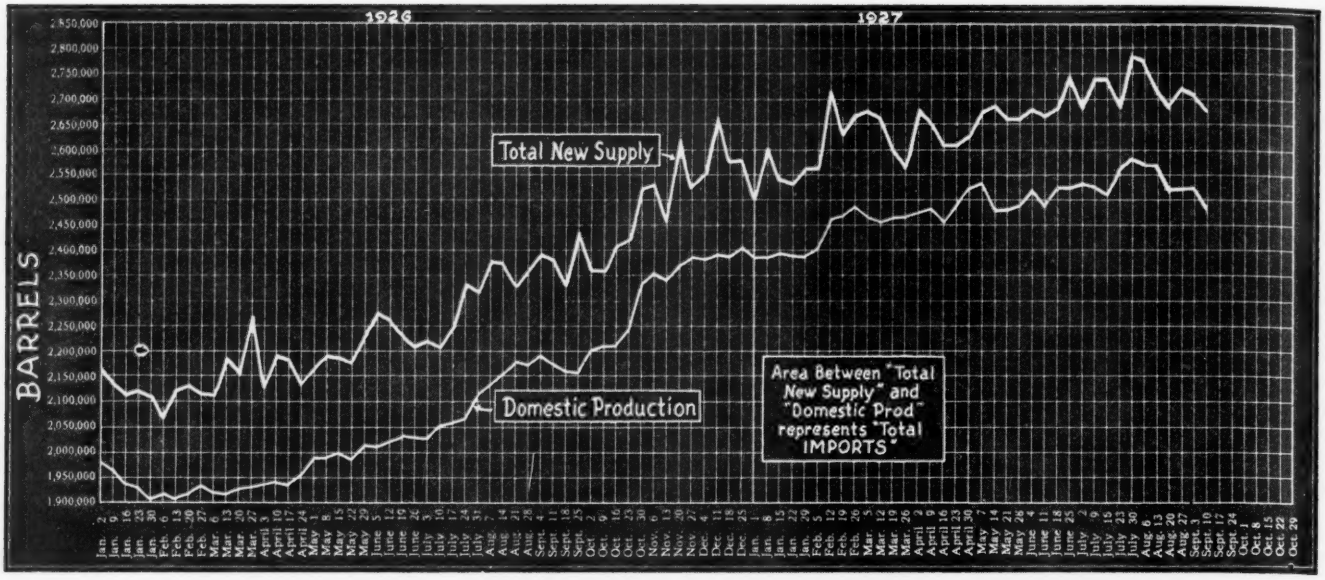
New Light Oil Field Reported in Mexico

HOUSTON, Sept. 13.—Reports reached Houston today of the light oil discovery well of a new district in northern Mexico. It is across the border from Rio Grande, Texas, on one of the several anticlines mapped on the Salado uplift. The well is reported to be making between 200 and 300 barrels daily of 42 degree gravity oil along with 25,000,000 cubic feet of gas.

It was drilled by Dumes & Allen and the Mexican Government. Although further details of the strike lack confirmation the advices coming out of northern Tamaulipas are considered reliable, especially since the scene of drilling has been long recognized as geologically favorable. The Salado uplift was first discussed in detail on page 67, Jan. 3, 1923, issue of NATIONAL PETROLEUM NEWS.

SAN FRANCISCO, Sept. 12.—A pamphlet has just been issued by Merco Nordstrom Valve Company featuring the different uses of lubricated valves in the petroleum industry. Two additional pamphlets have been issued showing the uses in the gasoline extraction industry and in the gas industry. These three pamphlets are illustrated with interior views of plants showing different valve hook-ups and explains the manner in which Merco valves are placed in service. Copies of any or all of the pamphlets can be obtained upon request. The company maintains offices in various cities and principal office at 121 Second street, San Francisco, California.

Daily Average Crude Oil Production and Imports



Daily average gross output of United States, by fields, for week ending with dates below as compiled by American Petroleum Institute

PRODUCTION SUMMARY

	Sept. 10	Sept. 3
Production east of Rockies	1,851,250	1,881,557
Decrease		30,307
Total production in U. S.	2,490,650	2,512,250
Decrease		21,600
Crude oil imports	185,857	192 429
Decrease		6,572
Total crude supply	2,676,507	2,704,679
Decrease		28,172

GULF COAST

Coastal Texas

	Sept. 10	Sept. 3
West Columbia	8,850	8,700
Damon Mound	900	900
Big Creek	2,550	2,700
Boling	1,400	1,500
Blue Ridge	3,300	2,450
Pierce Junction	6,950	7,950
Humble	2,350	2,450
Goose Creek	8,350	8,650
South Liberty	2,800	2,800
Hull	14,400	14,000
Saratoga	1,000	1,200
Batson	1,300	1,300
Sour Lake	4,150	4,100
Spindletop	56,300	59,800
Orange County	4,700	4,850
Others	4,150	4,300
Total, Coastal Texas	123,450	127,650
Decrease		4,200

Coastal Louisiana

Vinton	5,050	5,200
Lockport	6,250	6,350
Evangeline	1,200	1,250
Edgerly	2,350	2,350
Others	1,950	800
Total, Coastal Louisiana	16,800	15,950
Increase		850
Total, Gulf Coast	140,250	143,600
Decrease		3,350

ROCKY MOUNTAIN

Wyoming

Salt Creek	33,400	31,000
Grass Creek	2,550	2,650
Elk Basin	1,000	1 000
Big Muddy	2,800	3,000
Lost Soldier	2,800	2,700
Rock River	2,200	2,700
Lance Creek	650	500
Teapot Dome	550	900
Others	4,500	5,200
Total, Wyoming	50,450	49,650
Increase		800

Montana

Cat Creek	2,100	2,100
Sunburst	10,000	12,500
Others	250	250
Total, Montana	12,350	14,850
Decrease		2,500

Colorado

	Sept 10	Sept. 3
Moffat (Craig)	1,550	1,600
Fort Collins	3,950	3,000
Florence	900	1,050
Others	1,500	1,900
Total, Colorado	7,900	7,550
Increase		350

New Mexico

Table Mesa	250	250
Artesia	1,450	1,450
Hogback	650	350
Rattlesnake	300	350
Total, New Mexico	2,650	2,400
Increase		250
Total, Rocky Mountain	73,350	74,450
Decrease		1,100

California

Santa Fe Spring	40,500	40,500
Long Beach	91,000	91,000
Huntington Beach	68,000	69,000
Torrance	21,500	21,500
Dominguez	15,000	15,000
Rosecrans	8,000	8,000
Inglewood	33,500	34,000
Midway-Sunset	84,000	86,000
Ventura Avenue	57,900	53,700
Seal Beach	65,000	57,000
Others	155,000	155,000
Total California	639,400	630,700
Increase		8,700

Eastern

(Including, Ill., Ind., Ky., Ohio, W. Va., Pa., and N. Y.)	112,000	113,500
Decrease		1,500

OKLAHOMA

	Sept 10	Sept. 3
North Braman	3,050	3,100
South Braman	2,300	2,550
Blackwell	4,000	4,000
Hubbard	4,400	4,550
Thomas	4,450	4,600
Tonkawa	19,000	18,800
Garber	11,100	11,300
Burbank	36,450	37,100
Osage, outside Burbank	31,200	31,250
Watchorn	1,800	1,800
Cushing	21,200	21,200
Yale Jennings	9,800	9,800
Davenport	2,800	2,950
Bristow-Slick	25,100	25,150
North Okmulge	16,300	16,350
Lyons-Deaner	5,100	5,100
Stroud	1,250	1,250
Cromwell	12,150	12,150
Papoose	6,400	6,300
Wewoka	13,850	14,650
Seminole	272,200	286,450
Earlsboro	164,950	164,900
Duncan district	6,950	6,750
Graham	6,750	7,200
Fox	1,900	1,950
Healdton	15,000	15,000
Hewitt	9,600	9,700
Scholem Alechem	1,650	15,600
Others	68,150	68,450
Total Oklahoma	778,850	809,950
Decrease		31,100

KANSAS

Greenwood County	33,450	33,800
Florence-Covert	1,600	1,600
Peabody-Elbing	3,900	3,900
Eldorado-Towanda	14,050	14,000
Augusta-Fox-Bush	4,250	4,250
Rainbow Bend	2,200	2,200
Russell	2,500	2,600
Churchill	14,100	12,950
Others	29,500	29,400
Total, Kansas	105,550	104,700
Increase		850

NORTH LOUISIANA

Homer	4,700	4,700
Haynesville	7,100	7,200
Caddo, light	14,950	15,300
Caddo, heavy	5,350	5,150
De Soto, Red River	4,100	4,000
Elm Grove	700	700
Bellevue	1,250	1,150
Cotton Valley	5,350	5,450
Urania	10,200	9,650
Pleasant Hill	650	700
Total, North Louisiana	54,350	54,000
Increase		350

ARKANSAS

El Dorado	5,650	5,700
Smackover, light	10,300	10,250
Smackover, heavy	78,800	79,500
Stephens	1,200	1,250
Nevada	2,550	2,100
Lisbon	3,200	3,250
Others	100	100
Total, Arkansas	101,800	102,150
Decrease		356

TEXAS (OUTSIDE GULF COAST)

Panhandle District

Hutchinson County	78,000	77,750
Carson County	9,300	9,100
Gray County	9,750	9,850
Wheeler County	1,400	1,650
Others	50	100
Total, Panhandle District	98,500	98,450
Increase		50

North Texas

	Sept 10	Sept. 3
Burkburnett	13,000	13,100
Electra	12,250	12,450
Iowa Park and K-M-A	2,300	2,400
Wilbarger	12,200	12,350
Archer County	26,550	26,900
Montague-Cooke	16,050	16,300
Others	700	700
Total, North Texas	83,050	84,200
Decrease		1,150

West Central Texas

Stephens County	8,300	8,400
Eastland-Desdemona	9,000	8,600
Brown County	24,650	25,050
Coleman County	1,200	1,000
Callahan County	3,900	3,000
Shackelford County	6,000	6,700
Young County	10,950	9,750
Throckmorton County	1,350	1,300
Palo Pinto County	800	800
Others	1,350	1,350
Total, West Central Texas	67,500	65,950
Increase		1,550

West Texas

Jones County	1,800	1,850
Mitchell and Scurry Counties	3,750	3,950
Howard County	3,350	3,300
Reagan County	24,850	25,150
Crane and Upton Counties	128,300	123,500
Crockett County	1,350	1,500
Pecos County	6,150	5,800
Winkler County	4,850	.....
Others	2,000	4,550
Total, West Texas	176,400	169,600
Increase		6,800

East Central Texas

Mexia	9,650	9,600
Currie	650	700
Richland	800	850
Wortham	2,650	2,700
Corsicana-Powell	14,650	14,800
Nigger Creek	2,000	2,500
Total, East Central Texas	30,400	31,150
Decrease		758

Southwest Texas

Luling	16,300	16,700
Lytton Springs	1,750	1,800
Somerset	900	900
Laredo District	9,750	9,900
Piedras Pintas	50	50
Others	500	500
Total, Southwest Texas	29,250	29,850
Decrease		600
Total, Texas—(Outside Gulf Coast)	485,100	479,200
Increase		5,900

Little River Outposts Near Completion Seminole Continues Decline

By Lawrence E. Smith

TULSA, Sept. 10

NOT much happens in the Mid-Continent any more except in the Seminole district and too much happens there. It is still a land of nightmarish possibilities and the oil operator who is trying to make a profit can work himself into a cold sweat if he spends any time considering the things that might still happen.

The four older pools of the district are, at the moment, on their way down with promise that the tendency will continue. Little River, if unchecked by the operators or by nature's failure to store much oil there, will keep the district's output at a high figure for quite a while.

As noted in another article in this issue, things didn't look too bright at the end of the week for proration in Little River. As for nature, it remains to be seen how big the field will be. Several outpost wells are now at the stage where they will tell some kind of a story soon, or rather, they should. But, in a field where the two highest wells structurally were the ones first to make water, it is impossible to reach any firm convictions as to the meaning of wells of any kind.

As to this downward tendency: During the week Sept. 2-9, Seminole district as a whole fell 22,000 barrels on daily averages of those dates, although 25 more wells were added. The declines by fields were as follows:

Bowlegs gained 4 wells and lost 9,985 barrels; Earlsboro gained 9 wells and lost 14,355 barrels; Searight gained 5 wells and gained 1,229 barrels; Seminole proper gained 1 well and lost 4,808 barrels; Little River gained 6 wells and lost 3,424 barrels. The decline in the latter was purely artificial and due to holding back production while the other fields are producing all they will make. There is now no attempt at proration in the four pools, as they are far under the 450,000 barrel daily mark set up in the operators' agreement early in August.

Earlsboro production hops up and down from day to day. For example, on Sept. 10, it gained 6,230 barrels. This was due to completion of several big wells. The tendency is more and more for the big fellows in Earlsboro to decline sharply, however, so their contribution to boosting the field total is not long felt.

Good news and bad news were wrapped up in the same package in the Little River happenings of the week. It was bad news to the operating company and good news to those who pray for a small pool when the Mid-Continent Petroleum Corp.'s No. 1 Wadsworth, in the southwest corner of 36-8-6, a direct north offset to the discovery well of the field, went into water. It found the top of the pay at 4220 feet, went in 4 feet and made 475 barrels. It went out of this pay, which proved to be only 4 feet thick, into a shale break 2 feet thick. After going through the break it again found sand, but it was water bearing.

AS a result of this circumstance, the company has shut down its four north line wells on the lease. It is an 80-acre tract and 8 wells were drilling. It is continuing to drill its No. 2 well, the next one east of the No. 1 and its No. 8, in the southeast corner of the lease. It has shut down the No. 5, midway between Nos. 2 and 8. Thus, five wells will be held up until further deepening of No. 1 and completion of the other two give them more information. No. 2 is running quite low as compared with the I.T.I.O.'s discovery well. The latter had the top of the Viola lime at 3927 feet and the Mid-Continent's No. 2 Wadsworth had it at 4212 feet. As the elevations are practically the same, the No. 2 Wadsworth is about 285 feet lower structurally than the discovery.

There are 30 wells drilling in the area around the discovery that have been standardized and will soon be completed. The outpost well to the east, from the standpoint of probable completion date, is the Gypsy Oil Co.'s No. 1 Wadsworth, SW SE SE of 36-8-6. This is a mile from the discovery well. The farthest southwest well to be standardized is the Twin State Oil Co.'s No. 1 Sam Davis, SE NE SW of 2-7-6, three-fourths of a mile diagonally southwest from the discovery. The same company's No. 2 on the same lease, a location north of No. 1, has changed to standard tools, as has the Barnsdall Oil Co.'s No. 1 Rhoda Davis, in the SE SE NW of 2-7-6, one location north of the Twin State's No. 2. The extreme northwest well to be standardized is the Gypsy Oil Co.'s No. 1 in the SE NE SW of 35-8-6, a half mile diagonally northwest from the discovery.

These wells will have some interpretive value as to the scope of the field, although not conclusive, as production is frequently found a location from a dry hole in this country. Thus far, the production has been from a small area around the discovery. Soon the outlying precincts will be heard from.

AMERADA PETROLEUM CORP.'S No. 1 Nitey, in the NE SE NE of 2-7-6 is a south offset to the I.T.I.O.'s No. 2 Nitey, which in turn is a diagonal southwest offset to the discovery. The latter, at the end of the week, was showing for a well and was connecting to lines. The Amerada's well was 23 feet lower structurally than the discovery and at total depth of 4068 feet it made 675 barrels of oil and 75 barrels of water. Thus, it and the discovery, until the Mid-Continent's first well went into water, were the only ones in the field to

Drilling Operations in Oklahoma, Kansas and Texas, Week Ended September 10, 1927

	September 10 Loc.	Rigs	Drg.	S.D.	Week Total	Ended Loc.	Rigs	Drg.	S.D.	Sept. 3 Total
OKLAHOMA										
Burbank	..	5	8	9	22	..	5	5	9	19
Other Osage	4	3	17	5	29	6	6	19	4	35
Bristow-Cushing	1	3	39	7	50	3	4	44	8	59
North Oklahoma	8	8	64	44	124	3	2	30	15	50
South Oklahoma	13	20	115	36	184	12	16	113	31	172
Muskogee	..	8	30	11	49	..	8	33	10	51
Okmulgee-Bristow	7	41	63	19	130	8	41	68	18	135
Seminole Dist.	26	35	539	42	642	35	40	550	43	668
Total Oklahoma	59	123	875	173	1,230	67	122	862	138	1,189
KANSAS	26	56	120	68	270	35	53	121	69	278
TEXAS										
Central	..	114	183	129	426	..	121	188	123	432
East		No Report					No Report			
Panhandle	..	73	110	101	284	..	74	115	104	293
N. Central	..	37	95	33	165	..	47	87	33	167
West	..	110	175	92	377	..	116	173	110	399
Laredo	..	1	25	19	45	..	1	25	19	45
Total Texas	..	335	588	374	1,297	..	359	588	389	1,336
GRAND TOTAL	85	514	1,583	615	2,797	102	534	1,571	596	2,803

Seminole District Production by Companies and Leases, September 9 and September 2, 1927

Company	Farm	S.T.R.	Sept. 9th No. Wells	Sept. 9th Prod.	Sept 2nd No. Wells	Sept 2nd Prod.
BOWLEGS						
Amerada	Rascoe	15- 8-6	8	6,770	8	8,470
Atlantic	Baker	1- 8-6	4	2,483	4	2,293
Atlantic	Fleet	23- 8-6	4	1,919	4	1,871
Atlantic	Grayson	12- 8-6	1	2,385	1	2,430
Atlantic	A. Jones	16- 8-6	4	115	4	146
Atlantic	C. Jones	9- 8-6	1	2,520	1	2,477
Total Atlantic			14	9,422	14	9,217
Barnsdall	McNac	28- 8-6	1	50	1	60
Barnsdall	Murrow	11- 8-6	4	2,272	4	2,404
Total Barnsdall			5	2,322	5	2,464
Carter	Bowlegs	15- 8-6	3	2,987	3	2,755
Carter	Harjoche	15- 8-6	6	2,575	6	2,835
Carter	Hilly	23- 9-6	1	1,690	1	1,910
Carter	McGeisey	15- 8-6	1	0	1	0
Carter	Walker	15- 8-6	2	1,040	2	1,140
Carter	Wise	23- 8-6	10	9,845	9	9,210
Total Carter			23	18,147	22	17,850
Empire	Lacey	15- 8-6	6	1,722	6	2,029
Empire	Wise	23- 8-6	1	2,235	1	2,407
Total Empire			7	3,957	7	4,436
Gypsy	Bowlegs	22- 8-6	1	737	1	830
Gypsy	Brown	33- 8-6	1	90	1	93
Gypsy	Cumsey	8- 8-6	3	775	2	568
Gypsy	Grayson	13- 8-6	1	1,812	1	1,958
Gypsy	Walker	15- 8-6	8	3,765	8	1,958
Gypsy	Wise	23- 8-6	2	185	2	83
Total Gypsy			16	7,364	15	7,212
Independent et al	Coker	21- 8-6	1	485	1	510
I. T. I. O.	Barnett	24- 8-6	2	1,415	2	1,571
I. T. I. O.	Billington	22- 8-6	2	947	2	1,141
I. T. I. O.	Bowlegs	22- 8-6	7	3,843	7	4,119
I. T. I. O.	Davis	13- 8-6	3	1,980	3	2,103
I. T. I. O.	Fay	18- 8-6	1	1,592	1	1,614
I. T. I. O.	Goforth	15- 8-6	10	3,965	9	3,868
I. T. I. O.	Livingston	15- 8-6	12	10,680	12	11,604
I. T. I. O.	Lizzie	11- 8-6	1	499	1	586
I. T. I. O.	Walker	15- 8-6	8	3,711	8	4,090
I. T. I. O.	Wilmont	15- 8-6	4	3,056	4	3,315
I. T. I. O.	Work	24- 8-6	1	914	1	979
I. T. I. O.	Youngblood	24- 8-6	4	947	4	1,027
Total I. T. I. O.			55	33,499	54	37,021
McCullough	Bowlegs	22- 8-6	3	560	2	510
Mic-Continent	Baker	10- 8-6	4	4,817	4	5,362
Mid-Continent	Bowlegs	22- 8-6	1	1,040	1	1,176
Mid-Continent	Hutke	24- 8-6	1	5	1	20
Total Mid-Continent			6	5,862	6	6,567
Minnehoma	Bowlegs	15- 8-6	4	2,455	4	2,833
Prairie	Gahagan	23- 8-6	3	2,425	3	2,735
Prairie	Harber	10- 8-6	7	4,460	7	5,415
Prairie	Templeton	12- 8-6	1	3,040	1	3,210
Prairie	Whitney	23- 8-6	4	888	4	1,035
Total Prairie			15	10,813	15	12,395
Pure	Reed	14- 8-6	14	10,847	14	11,803
Pure	Strother-E	16- 8-6	1	15	1	15
Pure	Strother-D	14- 8-6	1	1,231	1	1,358
Pure	Strother-F	10- 8-6	1	652	1	650
Total Pure			17	12,745	17	13,826
Roxana et al	Taylor	16- 8-6	5	3,215	5	3,387
Shaffer	Lacey	14- 8-6	3	1,032	3	1,153
Sinclair	Adam	22- 8-6	1	0	1	5
Sinclair	Bowlegs	22- 8-6	1	0	1	0
Sinclair	Cumsey		2	876	2	646
Sinclair	Ellen	11- 8-6	3	1,680	3	1,880
Sinclair	Harjo	14- 8-6	3	2,475	3	2,905
Sinclair	Jones	8- 8-6	4	7,570	4	8,455
Sinclair	Taylor	10- 8-6	3	4,075	3	4,599
Sinclair	Walker	22- 8-6	4	2,790	4	3,010
Total Sinclair			21	19,466	21	21,500
Texas	Reed	14- 8-6	7	7,425	7	7,085
Tidal	Harjoche	10- 8-6	4	2,515	4	2,655
Twin State	Jones	11- 8-6	1	2,185	1	2,155
TOTAL BOWLEGS			215	150,247	211	160,232
LITTLE RIVER						
Amerada	Nitey	2- 7-6	1	405	0	0
Blackwell	Nitey	35- 8-6	3	2,357	2	5,719
I. T. I. O.	Dungan	35- 8-6	1	942	1	4,266
I. T. I. O.	House	1- 7-6	1	1,200	1	2,835
I. T. I. O.	House M. A.	1- 7-6	1	1,188	0	0
I. T. I. O.	Jackson	1- 7-6	1	2,954	0	0
I. T. I. O.	Nitey	2- 7-6	1	1,253	1	4,837
I. T. I. O.	Reed	1- 7-6	1	2,459	0	0
Total I. T. I. O.			7	9,995	0	0
Mid-Continent	Wadsworth	36- 8-6	1	475	0	0
TOTAL LITTLE RIVER			11	13,233	5	17,657

Company	Farm	S.T.R.	Sept. 9th No. Wells	Sept. 9th Prod.	Sept 2nd No. Wells	Sept 2nd Prod.
EARLSBORO						
Amerada	Anderson	15- 8-5	4	3,630	4	3,665
Amerada	Cowden	4- 9-5	4	2,345	4	3,910
Amerada	Rogers	3- 9-5	2	7,500	1	4,665
Total Amerada			10	13,475	9	12,240
Barnsdall	Bruner	10- 9-5	1	28	2	65
Barnsdall	Brown	10- 9-5	1	4,464	1	3,536
Barnsdall	C. Cudjo	11- 9-5	1	31	2	2,984
Barnsdall	D. Davis	11- 9-5	2	2,948	2	248
Barnsdall	J. Davis	11- 9-5	2	250	3	2,403
Barnsdall	M. Davis		3	2,150	0	0
Barnsdall	Gibson	9- 9-5	6	8,238	6	10,783
Barnsdall	Hearn	15- 9-5	1	0	1	19
Barnsdall	Hooly	4- 9-5	1	0	1	11
Barnsdall	Ingram	4- 9-5	1	272	1	408
Barnsdall	Pack	10- 9-5	4	2,503	3	2,937
Barnsdall	Peter	10- 9-5	3	728	3	783
Barnsdall	Salbolka	15- 9-5	1	2,813	1	2,796
Barsndall	Sango	2- 9-5	1	154	1	113
Barnsdall	Smith	15- 9-5	1	2	1	8
Barnsdall	Sullivan	1- 9-5	4	2,037	4	2,404
Barnsdall	Watsutke	12- 9-5	2	2,075	2	2,269
Total Barnsdall			35	42,168	34	31,769
Carter	Payne	12- 9-5	2	1,775	1	880
Carter	Sango	2- 9-5	1	180	1	180
Total Carter			3	1,955	2	1,060
Continental	Spencer	12- 9-5	2	5,715	1	6,085
Crosbie	Bryant	9- 9-5	2	1,643	2	1,722
Empire	Edmundson	3- 9-5	1	3,136	2	3,596
Gypsy	Bruner	10- 9-5	2	5,585	2	6,262
Gypsy	Carter	11- 9-5	4	4,017	3	360
Gypsy	Earl	16- 9-5	1	0	1	0
Gypsy	McFarland	9- 9-5	2	0	2	75
Gypsy	Noble	12- 9-5	1	1,845	1	2,042
Gypsy	Peter	10- 9-5	4	1,765	4	1,883
Gypsy	State	16- 9-5	4	995	4	1,085
Gypsy	Strain	17- 9-5	1	10	1	0
Total Gypsy			19	14,232	18	11,707
Independent	Bruner	10- 9-5	1	38	1	40
Independent	Gaines	11- 9-5	1	2,060	1	2,835
Independent	Knappen	8- 9-5	3	680	4	1,195
Independent	O'Dell	4- 9-5	4	6,410	4	10,130
Independent	Sullivan	10- 9-5	3	2,720	2	170
Total Independent			12	9,848	12	14,370
Interocean	Payne	12- 9-5	1	188	1	0
Magnolia	Bryant	9- 9-5	4	1,890	4	1,771
Magnolia	Edmundson	3- 9-5	2	2,093	2	2,885
Magnolia	Holmsley	11- 9-5	6	9,061	6	8,762
Magnolia	Ingram	10- 9-5	1	37	1	55
Magnolia	Lena	10- 9-5	2	184	2	57
Magnolia	Seay	12- 9-5	4	2,484	4	2,687
Magnolia	Simpson	10- 9-5	2	0	3	16
Magnolia	Sparks	11- 9-5	6	5,244	6	5,348
Total Magnolia			28	20,993	28	21,597
Mid-Continent	McCumber	9- 9-5	5	2,635	4	3,840
Mid-Kansas	Anderson	14- 9-5	1	0	1	60
Phillips	Dunnaway	15- 9-5	1	30	1	26
Phillips	Graham	9- 9-5	6	1,630	6	2,072
Total Phillips			7	1,660	7	2,098
Prairie	Baker	24- 9-5	1	50	1	50
Prairie	Davis	13- 9-5	3	1,425	3	2,900
Prairie	C. Graham	3- 9-5	2	5,960	1	4,615
Prairie	O. Graham	10- 9-5	4	8,945	4	11,305
Prairie	Stidham	11- 9-5	7	9,505	7	6,755
Total Prairie			17	25,885	16	25,625
Roxana	Hearn	13- 9-5	1	0	1	0
Roxana	Spencer	12- 9-5	2	3,930	2	4,123
Total Roxana			3	3,930	3	4,123
Sinclair	Hollins		1	2,300	0	0
Skelly	Spencer	12- 9-5	1	2,807	1	9,970
Texas	Brown	10- 9-5	3	181	2	70
Texas	Rogers	5- 9-5	1	7,165	1	7,388
Texas	Wilmont	10- 9-5	1	206	1	235
Total Texas			5	7,552	4	7,693
Twin State	Barker	12- 9-5	1	2,895	1	3,140
Twin State	Hearn	2- 9-5	1	2,580	1	2,910
Total Twin State			2	5,475	2	6,050
Tidal	Watkins	9- 9-5	4	2,775	4	5,105
TOTAL EARLSBORO			166	156,957	157	171,312
TOTAL SEARIGHT			51	31,490	46	30,261
TOTAL SEMINOLE PROPER			320	75,339	319	80,147
GRAND TOTAL SEMINOLE DISTRICT			763	427,266	738	459,609
Average per well				546.8		622.8

show water, although they were the highest structurally.

Earlsboro contributed several good wells during the week. Gypsy's No. 6 Carter, in 11-9-5 made 3,800 barrels; Amerada's No. 1 Rogers, in 3-9-5 made 4,665 barrels and No. 2 Rogers made 4,700 barrels; Barnsdall's No. 3 Brown, in 10-9-5 made 1,657 barrels; Carter Oil Co.'s No. 6 in the SW NW NW of 11-9-5 made 3,762 barrels; Independent Oil & Gas Co.'s No. 2 Sullivan, in 10-9-5, made 2,789 barrels.

About one and one-half miles northeast of Bowlegs production and better than a half mile southeast of Seminole pool production, T. B. Slick got a good well that is probably an opener of a small pool—or maybe a large one. This well is the No.

Completions in Oklahoma and Kansas, Week Ended September 10, 1927

OKLAHOMA

Beckham County

Company	Well No.	Location	Depth	Init. Prod.
Pferfell et al	1	NEc 35-9-22 W	T.D. 300	Dry

Caddo County

English	6	C NE SE 31-6-9 W	1990-2340	50

Carter County

Magnolia	1	NEc SW NW 29-1-3 W	2941-3211	172
Schermerhorn et al	2	SEc NE SW 11-2-3 W	3285-4000	250
Magnolia	9	NEc NW NE 26-2-3 W	2765-3008	15
Westheimer	2	NWc 18-1-3 W	T.D. 3029	Dry

Creek County

Haddock et al	1	SWc SE 10-18-9 E	T.D. 3128	Dry
Kessler et al	1	NWc SE NE 36-18-10 E	T.D. 2733	Dry
Curtis	1	NWc 30-18-11 E	T.D. 2677	Dry
Jackson et al	1	CSL SW NW 13-17-10 E	T.D. 2520	Dry
Pontiac	7	CSL SW SW 13-17-10 E	T.D. 2498	Dry
Wright	22	CNL NW NW 24-17-10 E	T.D. 2496	Dry
Carpenter et al	4	CWL NE SW 22-17-11 E	T.D. 2134 OWD	Dry
Devonian et al	3	NWc SW 36-16-7 E	2557-2601	80
Devonian et al	4	NEc SW NE 36-16-7 E	2450-2470	35
Wilson	1	NWc NE 10-15-8	3218-3223	37M
Roach et al	2	SWc NW SW NW 35-18-9 E	1923-1947	35
Purser et al	1	SWc NE SE 23-18-11 E	1898-1903	19M
Ray	5	CSL SE SW 13-17-10 E	2418-2443	300
Thompson et al	2	SEc NW 16-17-11 E	634- 643	2½M

Grady County

Magnolia	1	C SW NW 11-4-8 W	1750-1765	25M
Watchorn	1	NWc 13-4-8 W	2226-2307	40M
Prairie	5	SEc NE NW 21-3-5 W	1754-1776	105
Magnolia	1	SEc NE SW 22-3-5 W	T.D. 3540	Dry

Kay County

Larutan	1	NEc NW NW 30-27-1 W	737-743	½M

Lincoln County

Shaffer	1	SEc SW 31-17-5 E	4210-4240	1940

Mayes County

Dixon	1	SEc NE NE NW 8-20-19 E	T.D. 2395	Dry

Okfuskee County

Wigdon et al	1	CNL NE NE 20-10-9 E	3220-3242	40M

Okmulgee County

Peterson	2	C SE SW 9-15-14 E	1885-1886	5M
Misner et al	2	NWc SE 10-15-14 E	981- 994	30
Misner	1	SWc NE 10-15-14 E	981- 992	10
Lambert	2	SWc NE SW NE 30-13-15 E	780- 785	20M
Anadarko Western	1	NWc SE SW 30-15-12 E	T.D. 2878	Dry
Wilder et al	1	SWc NW NE 17-14-12 E	T.D. 2903	Dry
Eagle Pitcher Lead	1	NEc NW SW 6-12-12 E	T.D. 2599	Dry

Osage County

Wiser	74	NEc SE SW SW 15-27-12 E	T.D. 694	Dry
Wiser	75	NEc 21-27-12 E	T.D. 698	Dry
Phillips	1	NEc SE 19-26-6 E	T.D. 2997	Dry
Sand Springs Home	105	CNL SE 10-21-9 E	T.D. 2236	Dry
Winona	1	NWc 17-21-11 E	T.D. 965	Dry
Lefeyer	13	SWc NE SW NW 1-28-10 E	1120-1147	5
I. T. I. O.	269	NEc 17-27-11 E	1920-1926	2¼M
McCurn et al	7	NEc SE NW 15-24-8 E	482- 510	5

Pawnee County

Baker	1	SEc SW SW 3-20-6 E	3052-3096	5M
Magnolia	2	NWc SW NE 15-20-6 E	3083-3370	17
Victor	1	CWL NW SW 22-22-7 E	T.D. 2700	Dry

Payne County

Shaffer	1	NEc SE SW NE 9-18-5 E	2856-2885	17M

Pontotoc County

Shaffer	2	SWc NW NW 16-5 8 E	T.D. 1140	Dry
Shaffer	1	SWc NW NW 16-5-8 E	2442-2448	300
Homa Okla	2	SWc SE SE 17-5-8 E	2460-2497	90

Pottawatomie County

Carter	1	SWc SE SE 19-7-4 E	3772-3926	20 & 11M
Magnolia	3	NEc SW 4-9-5 E	T.D. 3335	Dry
Pure	2	NWc SW 16-9-5 E	T.D. 4535	Dry
Roxana	1	NE NE NW 33-7-5 E	T.D. 4315	Dry

Seminole County

Company	Well No.	Location	Depth	Init. Prod.
I. T. I. O.	1	NWc 13-9-6 E	T.D. 4494	Dry
Slick	4	NWc SE SE 35-9-6 E	T.D. 4555	Dry
Gypsy	1	SEc NW SE 23-9-7 E	T.D. 3725	Dry
Gypsy	1	SEc SW NW 28-9-7 E	T.D. 2750	Dry
Pure	1	NWc NE NE 28-9-7 E	T.D. 3540	Dry
Pure	18	NEc SE NW 14-8-6 E	T.D. 4370	Dry
Gypsy	1	NEc NW SE 22-8-6 E	T.D. 4387	Dry
Mid-Continent	1	NEc SW NW 28-7-6 E	T.D. 4495	Dry
McCullough	1	NWc 14-10-5 E	T.D. 4901	Dry
Sinclair	5	NWc NE 4-10-8 E	T.D. 3460	Dry
Magnolia	1	SWc SE SW 12-9-5 E	T.D. 4415	Dry
Magnolia	2	SEc SW 12-9-5 E	T.D. 4322	Dry
Gypsy	2	NEc NW NE 15-9-5 E	T.D. 4414	Dry
Gypsy	2	SWc NW NE 10-9-5 E	4298-4313	2785
Barnsdall	2	CSL S½ SE 11-9-5 E	4477-4484	2007
Magnolia	1	NWc SW 11-9-5 E	4285-4288 OWD	1830
Magnolia	6	SEc NW SW 11-9-5 E	4274-4295	2336
Magnolia	4	SWc 12-9-5 E	4295-4315	1479
Wilcox	3	NWc NE 4-9-6 E	4364-4386	528
Wilcox	5	NEc NW 4-9-6 E	4390-4413	1440
Sinclair	2	NEc 22-9-6 E	4180-4222	385
Gypsy	4	NWc SW NE 34-9-6 E	4442-4598	25
Slick	3	NEc SE 35-9-6 E	4052-4088	1600
Pure	6	SEc SW NW 36-9-6 E	4127-4144	717
Sinclair et al	1	SEc SW NW 17-9-7 E	3421-3487	42 & 7M
Atlantic	2	NEc SE SE 10-8-6 E	4146-4168	1000
Gypsy	2	SWc NE SE 10-8-6 E	4174-4295	487
Pure	1	SEc NW 10-8-6 E	4405-4429	630
Gypsy	1	SWc NW NW 13-8-6 E	4198-4215	2245
Empire	7	SWc NW SW 14-8-6 E	4294-4404	90
I. T. I. O.	10	SWc NW NE 22-8-6 E	4230-4245	237
McCulloch	2	NWc 22-8-6 E	4333-4440	35

Sequoyah County

Orr et al	1	NWc 15-10-26 E	2817-2840	1M

Stephens County

Amerada	1	NEc SE SW 12-14 W	2073-2509	7M

Wagoner County

Dampton	1	SEc NE SW 9-15-16 E	T.D. 2100	Dry

Washington County

Grady et al	1	NWc NE NW NW 22-24-13 E	T.D. 1421	Dry

KANSAS

Butler County

Empire	1	NEc NW 27-27-5 E	2721-2762	15
Empire	1	NWc NE SE 27-27-5 E	2738-2757	50
Davis et al	2	SWc NW SW 3-27-6 E	3150-3158	150
Intersea	2	SEc NE SW 9-27-6 E	T.D. 3178	Dry
Ritchey et al	1	NEc 6-27-8 E	T.D. 2800	Dry
Empire	1	NWc SE NE 3-28-5 E	T.D. 3152	Dry

Coffey County

Ritchey et al	1	SEc 19-22-16 E	T.D. 1447	Dry

Cowley County

Roxana	1	SWc 21-30-3 E	T.D. 3164 OWD	Dry
Roxana	1	SWc NW SE 16-31-3 E	T.D. 3200	Dry

Elk County

Kans. Central	1	SEc SW 9-31-9 E	T.D. 2280	Dry
Ark. Fuel	2	C SW SW 17-29-10 E	1246-1252	2½M
Theta	1	SWc 26-29-10 E	1971-1986	½M

Greenwood County

Dayby et al	3	SWc SE SW 24-22-12 E	1653-1683	200
Empire	2	NWc NE NW 25-22-12 E	1644-1712	500
Rogers et al	1	SWc SE SW SW 35-25-10 E	1972-2023	50
Mendenhall et al	1	SEc NW 5-25-13 E	1423-1450	3½M
Rogers et al	1	NEc NW NW 2-26-10 E	1990-2020	25
Ritchey et al	1	NWc NE NE 8-22-11 E	T.D. 2180	Dry
Rhodes et al	1	SEc NE SW 14-22-12 E	T.D. 1857	Dry
Rhodes et al	1	NEc NW 7-24-11 E	T.D. 2065	Dry

McPherson County

Osttot et al	1	SWc NW SE 22-18-3 W	T.D. 3608	Dry

Sumner County

Merridan	1	SEc SW NE 18-35-1 E	T.D. 2360	Dry

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1 Tiger, in the NW NE NW of 1-8-6. Top of the sand was at 4135 feet. The well made 1015 barrels. Intervening in the distance to Seminole pool proper is a dry hole in the Wilcox drilled by the Gypsy in 36-9-6.

The Little River field, since the month opened, has performed as follows:

Date	Wells	Production
Sept. 1	5	20,386
Sept. 2	6	17,657
Sept. 3	6	10,533
Sept. 4	6	7,861
Sept. 5	7	7,909
Sept. 6	8	7,615
Sept. 7	8	6,614
Sept. 8	9	16,099
Sept. 9	11	13,233
Sept. 10	11	16,424

The figures illustrate the point that artificial restriction was playing an important part. The field at the end of the week could easily have made 35,000 barrels.

Slick's much discussed wildcat in 1-6-6, south of Little River, which had the fraternity making mind bets as to whether it would open another ocean of oil is now out of the running and will not worry the internal revenue department as to discovery rights. It got a sand which everybody except the owners say is the Wilcox. The owners haven't said anything. This sand was found from 3982 to 4002 feet and the hole filled with water. The operators are running 5-inch to shut off the water and will drill deeper.

Magnolia Petroleum Co has opened another Hunton lime pool, this one being one and a half miles southwest of the Pearson pool, which stirred up a lot of excitement early in the year but which has been proven to be a Wilcox failure. The Magnolia well is in the SW NE of 36-7-3 and at total depth of 3800 feet has 2600 feet of oil in the hole. It will be pumped.

The Continental Oil Co. got a good Hunton well in the Pearson pool in its No. 2 Doyle, SE NE SW of 19-7-4. Top of the Hunton was found at 3746 feet and at 3786 feet it flowed at the rate of 40 barrels per hour.

Completions in N.E. Central, West, Panhandle and North Texas, Week Ended September 10, 1927

NORTH AND EAST TEXAS

Brown County

Company	Well Farm	Location Survey	Depth	Init. Prod.
Forrest	8-Smith	SA&MG	1333-1345	500
Forrest	9-Smith	SA&MG	1343-1349	130
Roxana	4-Smith	SA&MG	1330-1350	583
Selby	12-Ellis	SA&MG	1317-1331	200
Selby	13-Ellis	SA&MG	1322-1341	400
Selby	14-Ellis	SA&MG	1318-1336	250
Humble	18-Kilgore		T.D. 1181	Dry
Gilman et al	1-Haynes	Delgado	T.D. 1275	Dry
Josey et al	1-Williams	Jones	T.D. 1476	Dry
Gholson et al	1-Collin	Collin	T.D. 1244	Dry
Ross	1-Miller	Swindell	T.D. 1646	Dry
Work	1-McGaughery	H&TC	T.D. 1405	Dry
Crites et al	1-Cutbirth	Martin	T.D. 1450	Dry

Callahan County

Navarro	4-Bennett	Booth	1643-1665	76

Coleman County

Henshaw et al	1-Cates	ET	T.D. 1237	Dry
Brooks et al	1-Odem	Mendock	T.D. 1110	Dry
Mimms et al	1-Kelley et al	Wharton	T.D. 1475	Dry

Comanche County

Texas-Pacific	1-Ward	ET	T.D. 2850	Dry

Eastland County

Chestnut-Smith	1-Martin	Richardson	T.D. 3527	Dry
Brown	1-Bean	H&TC	T.D. 3024	Dry
Huddleston et al	1-Fox	McLennon	1307-1618	65 & 2M
Adams et al	3-Grobes	SP	3825-3865	35 & 4½M

Navarro County

Sun	1-Swink	Boren	T.D. 5410	Dry

NORTH TEXAS

Archer County

Mear et al	14-Wilson	DLC	1525-1539	145
Young	4-Abney	SP	T.D. 1770OWD	Dry
McConnel	1-Wilson	ATNCL	T.D. 1535	Dry
Continental et al	1-Wilson	ATNCL	T.D. 1601	Dry
Roxana et al	1-Farmer	Pointevant	T.D. 1601	Dry
Bridwell et al	1-Aber et al	Harris	T.D. 1434	Dry
Dickson	1-Phillips	BBB&C	T.D. 1200	Dry

Cooke County

Sun	3-Hacker	Scott	1634-1657	95
Gray et al	3-Twinsite		1622-1649	96
McElreath et al	1-Harris	Ellerd	T.D. 1891	Dry
Ruwalt et al	1-Danglemeyer		T.D. 2105	Dry

Montague County

Company	Well Farm	Location Survey	Depth	Init. Prod.
Benson et al	1-Rucktaskel	Baynie	T.D. 2519	Dry

Wichita County

Petroleum Prod.	3-Munger	KWVKL	T.D. 2020	Dry
Elliott et al	1-Chilson	DCSL	T.D. 735	Dry
Wilson	3-Kempher	WVFH	1815-1825	25

Wilbarger County

Consolidated	1-Wheeler	H&TC	T.D. 2004	Dry
Vaughn et al	1-Ancel	H&TC	T.D. 1825	Dry

Young County

Roberts	2-Graham	TEL	T.D. 900	Dry
Baldwin et al	1-Drum	Tynus	T.D. 625	Dry

PANHANDLE

Gray County

Magnolia	1-Sniler	I&GN	3170-3280	85

Hutchinson County

Perryman et al	1-Sanford	H&TC	2295-2900	60M
McMillen	2-Sanford	H&TC	2966-2978	60M
Oil Operator trust	1-Sanford	H&TC	2671-3010	40M
Cowland et al	1-Johnson	A&B	2826-2835	40

Moore County

Douglad	1-Beachamp		4055-4065	12M

WEST TEXAS

Crane County

Gulf	29-McElroy	CCSD	2825-2921	160
Landreth	13-State		2865-3002	125
Landreth	14-State		2785-2937	3942
Texas	1-Univ.	Univ.	2845-2995	28
Tidal	1-Univ.	Univ.	2810-2936	240
Tidal	2-Univ.	Univ.	2802-2966	31

Kent County

Douglas	1-Scroggins	H&GN	T.D. 1538	Dry

Pecos County

Moutary	1-Robertson	H&GN	T.D. 1455	Dry
Quimby et al	2-Bennett	GC&SF	T.D. 1459	Dry

Upton County

Champlin	1-Lane	GC&SF	1920-1964	80
Dixie	29-Burleson	Nidiver	2075-2107	25
Gulf Prod.	4-Lane	GC&SF	1950-1964	265
Texas	3-Perry	GC&SF	1971-1973	908

Winkler County

Southern Crude	88-Hendricks	PSL	2930-3077	800

Completions in North Louisiana and Arkansas, Week Ended September 8, 1927

Company	Well	Location	Depth	Yield
Louisiana—Bossier Parish—Cartersville				
Magnolia Pet. Co.	Rogers No. 1	21-23-12	3088	15M gas
Texas Company	Mays No. 1	27-23-12	3145	2M gas
Woodley & Collins	Matlock No. 1	23-23-12	3071	26M gas
Caddo Parish—Caddo District				
Gulf Refining Co.	Tyson No. 14	14-21-15	3763	225 bbls.
Standard Oil Co. of La.	Stiles No. 188	33-21-16	1844	50 bbls.
Howard District—Caddo Parish				
Woodley Pet. Co.	Knight B-2	11-15-12	1935	4M gas
Richland Parish				
Gulf Refining Co.	Ouachita Nat. Bank No. 1	25-17-5E	2455	30M gas
Webster Parish—Cotton Valley				
Woodley Pet. Co.	Cox B-1	23-21-10	4310	4M gas

Company	Well	Location	Depth	Yield
Waskom-Harrison Co., Texas				
J. R. Bahan	Furrh No. 1	J. Short HRS	1003	5M gas
Jim Clark et al	Furrh No. 2	J. Short HRS	1942	2M gas
State Line O. & G. Co.	C. M. Abney No. 4	Cord M-18	1936	8M gas
Panola County Texas				
Magnolia Pet. Co.	Carrie Steele No. 10 Co-ord	E-14	2294	2M gas
Arkansas—Nevada County				
O'Brien et al	William Haynee B-2	1-14-21	1191	150 bbls.
O'Brien et al	Moss B-3	1-14-21	1174	150 bbls.
Smackover				
S. Richardson	Rhoten No. 2	32-15-15	2048	60 bbls
J. E. Crosbie	Berry No. 15	33-15-15	2367	80 bbls.
Lion O. & R. Co.	Hays No. 1	4-16-15	2619	10M gas

It was deepened to 3810 feet and the flow increased to 80 barrels per hour. The oil is 37 gravity.

The new pool in Lincoln county, south of Cushing, opened by the Shaffer Oil & Refining Co., got its second well during the week. The Texas Pacific Coal & Oil Co.'s test in the SW SE SE of 31-17-5E made 40 barrels per hour of 45 gravity oil from the Wilcox at 4175-84 feet, the flow starting at the latter depth. The Shaffer well, which had a maximum production of 1,942 barrels, is now pinched in to 120 barrels per day under 1,100 pounds back pressure. The two wells are a quarter mile apart. In the same area the Carter got a hole full of water from the Wilcox at 4275 feet, this being in the SW SE SE of 30-17-5E.

Associated Again Plans to Test Mystery Wildcat Well

LOS ANGELES, Sept. 10

WHEN the Associated Oil Co. tested its Cypress 1, it meant that a wildcat that has been shut down and idle for several months, located about midway between Inglewood and Rosecrans fields, near the Los Angeles city limits, was given a production test. It produced considerable gas, but very little oil.

The casing pressure of 650 pounds and tubing pressure of 200 pounds was considered encouraging. No perforated pipe was in the hole, and, since the hole has been standing full of mud for a long time, there is still a good chance the well will produce oil in commercial quantities. Some oil came from the hole during the test, and it was found this oil had a gravity of about 36, better than usually found in Los Angeles Basin fields. The gas is wet, and tests about 2 gallons to the thousand cubic feet.

The bottom of the hole is at 4450 feet, with a string of 8⅝-inch cemented at 4383 feet. The water has been shut off to the satisfaction of the state oil and gas department authorities. This well was being watched very closely last winter, when the Associated made tests indicating a new field was in the making. At that

time leasing was most active, and since the area to the east and north of the test well was made up of town lots, the scramble was wild, with prices mounting high. Practically every lot within two miles was leased, some of them at fancy figures.

Julian Petroleum, later California Eastern, secured a large number of lots, at one time had 10 locations spotted and two wells were drilled, one to the east and another to the north, and both wells proved dry. One hole was drilled to 4820 feet, while the other quit at 5282 feet. During that time, Associated also drilled another, No. 1 Johnson, to 5507 feet and abandoned a dry hole. This test was located about half a mile southeast of the original well. General Petroleum drilled a dry hole and Getty also started to drill two wells, but quit when he saw what the wells about him were doing.

As the Associated apparently held all of the acreage that looked good, after several dry holes were drilled, amounting to more than 800 acres, some of it in fee, the excitement died down and the locality went to sleep. The Associated officials felt that there was no need of drilling in the well during the first part of the year, with over production in the state having reached a stage that was doing the oil industry no good. So the well stood idle.

Associated drilled out the cement in the Cypress late in April, drilled in a few feet, and suddenly shut down all operations and sent the crew to another well. Once in August a crew was sent to the well and all preparations made for a production test, but for some unknown reason the crew was ordered away, and again the scouts of the other companies were wondering what it was all about.

It is understood the present test will be continued until it is found just what the well is worth. On Saturday the crew was still working, and some word as to results is expected Sunday or Monday, if all goes well. Perforated pipe is to be run in and the well will continue on the swab until the hole has been thoroughly cleaned out. Due to having stood so long with mud in the hole, it is barely possible the oil has been mudded off and it may require quite a little work to bring the oil into the well in commercial quantities, if oil is there in such quantities.

Seal Beach started to climb again this week, with completion of several new wells in the Wasem, or deeper sand. Wells are being completed at around 5300 feet, with some of them slightly deeper. Twelve new wells are expected to be completed within the coming ten days, all in the Wasem sand, and they should average above 1000 barrels each. The present Wasem sand producing wells during the past ten days have declined from a previous daily average of 1400 barrels to 1000 barrels each at the close of this week. The present extensive drilling campaign will be drawing near an end within two weeks and during that period the new high peak is expected, to be followed by a sharp decline. The old part of the Seal Beach field is declining rather rapidly, and during the past week, water began to show in the Standard wells producing from the Selover sand.

The Ventura Avenue field is also showing another increase in production, due to opening up of shut-in wells and completion of two new wells. Nine pumping wells at Ventura Avenue, capable of production not to exceed 50 barrels each, are still shut in, and may not be opened for some time. Twenty-nine wells are actively drilling in the field, and it is understood that the Shell Co. plans to keep five strings of tools active during the balance of the year. The Associated and General Petroleum also plan to continue their activity.

Hendricks Field at 25,000 Bbls. Yates Pool Extended

HOUSTON, Sept. 11

HENDRICKS field potential production in Winkler county, Texas, reached above 25,000 barrels daily with completion of wells that extended the producing area a mile and a half south and a mile east of the discovery area.

Southern Crude Oil Purchasing Co.'s No. 1-B-1 well in Sec. 4, came in for possible production of 6,000 barrels daily and the partnership well of Marland, Murchison, Cranfill and others in Sec. 35 had shown itself good for fully 3,000 barrels daily.

The Southern Crude arm of the Pan American group companies operates the only pipeline from the Hendricks area to tank car loading racks at Wickett on the Texas & Pacific railroad, but the Cullinan interests of Houston are building a similar short line in the territory to handle controlled and purchased oil.

Yates field production was carried across the Pecos River into Crockett county by the No. 1 George Thompson, of Gulf Production Co., which made a 30-barrel head in 15 minutes from brown sandy lime. The well is in Sec. 71, I. & G. N. Block 1, offsetting the Allsman & Bell small well in the Pecos River bed.

Spindletop's deepest producing well in Gulf Coastal Texas, which came in flowing wild at 5,038 feet early in the week, is now making 80 per cent salt water and about 1,500 barrels of oil. It is the No. 1 Weed of Hines and others on a one-acre tract adjoining other deep flank production on the southwest flank of the dome.

Pure Oil Co.'s No. 3, Sweet Lake, in Gulf Coastal Louisiana made 60 barrels an hour through one-half inch choker at 5,897 feet when worked over. It had been a small well for months.

J. A. Cambell Writes Book on Absorbtion

LOS ANGELES, Calif., Sept. 10.—A profusely illustrated book has just been published on the process of natural gasoline absorption by J. A. Campbell, natural gas engineer, of Long Beach, Calif.

The book delves into the many factors involved in extraction of gasoline from natural gas and is illustrated showing views of every part of a natural gasoline plant, including close-up illustrations of absorbers, strippers, interchangers, scrubbers, inlet and outlet lines, pumping mechanism, arrangement of cooling coils, and dephlegmators.

The cycle of operation starting with the gas coming from the well passing through the absorber and changed to dry gas and also the manner in which the gasoline is handled and treated after being removed from the natural gas is described in understandable language that any layman can comprehend.

A complete explanation is made of the manner in which billions of bubbles are used to absorb gasoline.

It is interesting to note that computation is made of the amount of oil film contained within a given area within an oil froth absorber. The writer estimates that within one cubic foot of oil froth is contained 603 square feet of oil film.

Copies of the book will be available on Sept. 15 and may be obtained upon request. The writer, J. A. Campbell, who also manufactures absorbers, will have a display at the Tulsa Exposition and copies of the book may be obtained at the exhibit.

A unique display has been arranged for the Tulsa Exposition by Mr. Campbell. A miniature working model of an absorption tower has been constructed within a glass cylinder so that the actual operation can be witnessed, giving the observer an excellent idea of the manner in which the oil froth is manufactured within an absorber. Added interest to the exhibition model is given by the use of special constructed diffusion lights hidden in the center of each oil froth pool.

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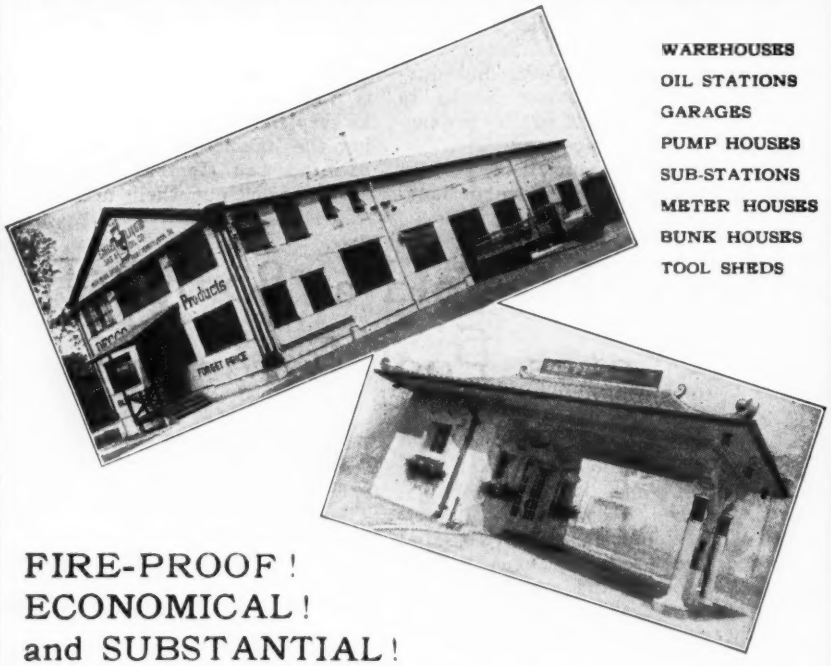

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Cities Service History Told in Booklet

NEW YORK, Sept. 13.—From 60 Wall St., headquarters of the Cities Service Co. and its 100 subsidiaries, comes a booklet entitled "Serving 3000 Communities", which gives the reader some idea of the history and vast scope of this company's operations, not only in the gas and oil producing, refining, transporting and marketing industries, but in the public utility field as well.

Organized in 1910 by Henry L. Doherty as a holding corporation for the numerous public utility enterprises which he had founded, the company acquired and developed extensive oil and gas properties through its natural gas division, until today it is one of the world's largest oil producing organizations. Today the company produces over 50,000 barrels of crude daily in Kansas, Oklahoma, Texas, Louisiana, Arkansas, Pennsylvania and Mexico and operates seven refineries in Pennsylvania, Texas, Oklahoma, New Jersey and Massachusetts.

The company also has its own trunk pipe lines, field gathering lines, tank cars, tank ships, storage and filling stations. The oil division has branches in Canada, Mexico and Europe, marketing agencies in Australia and the Far East, and through its marine department, operates a fleet of tank ships which transports over 575,000 barrels of oil per month. It operates about 1,000 miles of oil pipe lines and 7,700 miles of gas pipe lines.

It controls large reserve acreage in productive territory in the Mid-Continent, Arkansas, Louisiana, Pennsylvania and Mexico.

Its public utility subsidiaries which serve over 3,000 communities with gas, electric light, street railway and bus systems, operate in 17 states and in Ontario, serving a population of over 3,000,000 with 64,000,000,000 cubic feet of natural gas and with 8,300,000,000 cubic feet of manufactured gas yearly. It furnishes more than 1,300,000,000 kilowatt hours of electric light and power to 1,600,000 people in 600 communities. Its street railway and bus systems carry over 74,000,000 passengers yearly.

LINCOLN, Neb., Sept. 13.—That tourists are awake to the fact that a price cutter may sell them inferior products is pointed out by Charles M. Sutherland, secretary of the Nebraska Independent Oil Men's Association, in the "Weekly Nioma Service Bulletin," after a 2,500 mile trip in 10 states.

Mr. Sutherland's observation on this trip was that a tourist wants to buy an established product at a reasonable price, when he sees a big price sign announcing a price cut, he frequently avoids that station because he is afraid of the product.

Is Accurate Information Worth Its Cost?

By P. S. Tarbox
Independent Refining Co.

Read before National Petroleum Association Convention at Atlantic City, Sept. 14-16

EVERY manufacturer, marketer or distributor is interested in costs. More serious consideration and more earnest attempts to arrive at costs by our members are in evidence every day. More of our refining members have today a more approximate idea of their costs in the various departments than ever before.

It is no secret that many of the large refiners have applied cost accounting systems and are today able to tell their costs very accurately at any stage in the process of manufacture.

Paul C. Girard at Cambridge Springs last April said to us, "The necessity for complete and accurate cost data in the petroleum industry has been at no time greater than at present, and in no branch is this more true than in the refining."

With a constantly diminishing spread between the prices of crude and refined products, the introduction of cracking, tower and vapor distillation, and other processes which make obsolete today what was yesterday standard practice, it is essential that figures be at all times available recording past performances for use as a gauge in planning future progress.

Manufacturing operations should be so analyzed that the profitable can be ascertained and further developed, and the unprofitable remedied, or in so far as possible eliminated. These facts can be developed only through the study of detailed cost records and supplementary statistics, based on actual performance as indicated by the books of accounts.

THE function then of the refining cost department may be summarized as threefold:

1. To record and analyze in detail the processing operation as a guide to efficient refining practice.

2. To report the result of operations to the management through financial and operating statements from which it will be possible not only to analyze past performance, but also to establish specific manufacturing and sales policies.

3. To maintain records indicative of present financial status, future capital requirements, and the anticipated results from predetermined policies.

Carrying out these functions adequately the cost department becomes, in effect, the eyes of the management, and working hand in hand with the operator, can aid immeasurably by supplying a basis for an intelligent control of current operation as well as future development.

The general experience in our industry of those who are determining costs accurately have found that the study of these cost sheets enables them to watch closely any fluctuation of expense and it enables them to pass copies of these costs to their respective department heads responsible for same, this supplies the department head with a comparative relation of expense to the efficiency of the operations in his particular department heads in cooperating with the cost which also encourages the department accounting department and greater efforts in efficiency.

THE question constantly arises among those members of our association who have not a satisfactory cost accounting system as to how they can avail themselves of satisfactory methods.

We could scarcely expect Mr. Girard to visit our plants individually and install or explain his system. And again we of course are anxious to have the best, and while many of us who heard Mr. Girard explain his system in detail, failed to see an opportunity for improvement. Yet it might be that others constantly working in this department, brought together might find some points in his system that could be improved upon.

Briefly this leads us to the same problem that has confronted every trade association which has faced this problem and, as we know the oil industry is among the last to give this serious consideration. Every trade association has found it necessary to arouse "sufficient" interest with a large majority of their members, if the desired results were to be obtained.

We might for a moment consider some of the advantages in uniform methods of cost accounting:

1. It provides the "one best way" known to the industry to figure costs (although cost accounting is a progressive science and provision should be made for keeping the uniform methods up to date) thereby eliminating expensive experimentation by the members individually and independently.

2. Results in a better informed competition within the industry.

3. Enables the industry instantly to place facts before regulatory bodies.

4. Inspires confidence in the public that selling prices are established by producers who have full knowledge of the costs of the articles offered for sale.

5. Tends to convince the manufacturer who otherwise would fail to see the advantages of good cost accounting, of the desirability of adopting the methods which his competitors are successfully using.

6. Reveals lines of individual products which have been marketed on an unprofitable basis.

7. Provides in addition to the foregoing specific reasons all of the valuable features of good cost accounting generally, among which are the following:

A. Shows the danger line below which goods cannot be sold at a profit; thus serving as an insurer of profits.

B. Acts as a guide to the value, efficiency, and waste of workers, equipment, methods, operations and entire plants.

C. Provides a reliable guide and basis for estimating the cost of prospective business.

D. Furnishes current reports for comparing major cost items with standards which are predetermined and thereby measures and increases operating efficiency.

E. Establishes a standard manual of accounting practice so that if your clerk, bookkeeper or accountant leaves you, his successor will find a system the operation of which has been fully and completely developed.

IN ORDER to arouse interest or to continue the interest in this work, the cost accounting committee should have a place on the program of our association's conventions at which the latest developments of cost methods should be discussed and the inclination of some to diverge from the path of uniformity overcome. Anyone who has attempted to create interest in uniform cost accounting realizes there are some obstacles to overcome before all the members can be convinced that they should install uniform cost accounting methods. A few of these are:

Inertia.

Confidence in obsolete or inefficient systems or substitutes for systems and cost estimates checked by occasional tests.

Unwillingness to incur expense.

Opposition of department superintendent who does not want the boss to know too much about the facts.

Fear of figures or inability to un-

derstand figures.

Example of shrewd competitors who apparently succeed in spite of lack of systematic cost accounting.

And again some time some members believe that a cost system should be used to determine prices that should be increased, rather than to determine costs that should be reduced. Since they do not believe that they could get an increase in price, they do not feel the need for a cost system.

WE HOPE sufficient has been said to bring to you in a slight way the problem that this department faces in attempting work in this line, but in order to have a uniform cost accounting system, we all agree that if we do, we should have the best, one that is elastic, meeting the requirements of the refinery from the skimming plant to the modern complete refinery. This we cannot hope to accomplish quickly or without incurring some expense.

While there are members of our association who have very good cost accountants, who possibly would be willing to devote a reasonable amount of their time, it is doubtful if they would be willing or we would be justified in asking them to sacrifice the time and expense necessary for us to accomplish the desired results.

You can scarcely expect the trustee in charge of this department to be able to act as a secretary of a cost accounting bureau, and were this possible, it would require the cooperation of as many cost accountants in our association as are available, and would probably further necessitate an expert in this line who could devote a large portion of his time in behalf of this accomplishment until such a time as the system had been approved by your Directors.

IT IS quite possible that through our system of district organization this method could be explained in a very intelligent manner to each of our members. It is not intended to intimate that the installation of the cost accounting system is going to be expensive. It would probably require in some plants a slight increase in the clerical force, but you will remember that the "black crow" who bought his pigs in August at $4 and sold them in April at $4 "found out" that he couldn't make any money that way.

Surely if we agree with the above, we must recognize that the day has arrived when cost accounting is just as important as improved equipment and methods of manufacture and from the writer's viewpoint we have but one or two alternatives, either to join in the necessary expense and try to have available within the next six or nine months the best cost accounting system that we can devise, or we are all familiar with the fact that the American Petroleum Institute has already adopted the general balance sheet and is working diligently on uniform methods of oil accounting, both of which are tributary to a uniform cost accounting for the entire oil industry.

When you consider the tremenduous task that is the institute's you can realize that it would seem impossible for it to have available for the refining industry a cost accounting method within the next two or three years.

With these alternatives before us I believe those who are interested in this problem should make their wishes known to the newly elected board of trustees.

Airplane Production in U. S. Increased 69.6% in 1926

THE production of airplanes in the United States increased 69.6 per cent in 1926, according to the annual report of the Department of Commerce just issued. Production in 1926 totaled 1,253, compared with 789 plants in 1925. Production in 1925 was 34.4 per cent more than in 1923 when 587 planes were manufactured in the United States.

An indication of the importance of airplanes as growing consumers of petroleum products is seen in the government's report on the operation of the air mail system in 1926. There were 17 lines in operation at least part of 1926, some the entire year and some only a few months at the latter part of the year. The scheduled routes of the 17 routes totaled 9,295 miles.

Planes that operated on government lines traveled 2,292,263 miles during the year. The scheduled mileage of contract routes operated by private corporations totaled 2,136,-509 miles, making a total for the year of 4,428,772 miles traveled by mail planes.

Some of the privately operated companies with air mail contracts carried express matter and passengers in addition to the mail. Total passengers carried by contract lines was 5,782 and express matter totaled 1,733,090 pounds. Total mail carried by government planes was 433,649 pounds and by contract lines 377,206 pounds. Details of the operation of the airplane mail lines are given in the accompanying table:

On the 17 routes mentioned above there are 68 stations representing a planned investment of more than $17,500,000. This is in addition to the hundreds of airports which have been laid out by cities and towns not on the air mail lines.

The government report gives no indication of the total airplane mileage of such freight lines as that operated by the Ford interests which did a tremendous business in 1926, or of the mileage amassed by civilian aviators.

Low Price Station in Fostoria

CLEVELAND, Sept. 13.—The Low Price Filling Stations, operating stations in various Ohio towns under the management of Maurice Wolfe, president of the Meteor Motor Car Co., Piqua, Ohio, is about ready to open a station in Fostoria. It is understood it will start to retail gasoline there at 16 cents. This company now operates stations at Piqua, Cincinnati, Findlay, in Ohio, and Muncie, Ind.

Operations of Government and Contract Air Mail lines in 1926

Government Route	Mileage of Route	Scheduled Airplane Mileage	Mail Carried Pounds	Express Carried Pounds	Passengers Carried
Transcontinental	2,665	*1,860,180	286,028	.....	.....
New York-Chicago	770	*432,083	147,621	.....	.....
Contract Routes—Feeders					
New York-Boston	220	69,018	6,630	.....	.....
St. Louis-Chicago	277	102,885	22,718	.....	.....
Dallas-Chicago	995	463,670	63,191	.....	.....
Los Angeles-Salt Lake	589	303,924	76,564	300	258
Elko-Pasco	424	195,552	33,241	.....	.....
Detroit-Cleveland	148	49,764	1,721	1,033,338	.....
Detroit-Chicago	278	152,028	5,830	696,197	.....
Chicago-Twin Cities	384	113,555	7,235	.....	.....
Pueblo-Cheyenne	200	84,400	17,135	100	200
Contract Routes—Non-feeders					
Los Angeles-Seattle	1,073	196,824	19,645	.....	33
Miami-Atlanta	740	248,246	14,336	.....	939
Seattle-Victoria	78	9,833	55,839	.....	.....
Pilottown-New Orleans	80	21,360	51,696	.....	.....
Philadelphia-Washington-Norfolk	234	93,770	1,425	.....	3,695
Detroit-Grand Rapids	140	31,680	.....	3,155	657
Total	9,295	4,428,772	†810,815	1,733,090	5,782
Government Total	.....	2,292,263	433,649	.....	.....
Contract Total	.....	2,136,509	†377,206	.....	.....

*Actual mileage.

†Approximately 199,125 pounds of mail carried by feeder contract lines was carried by the transcontinental and New York-Chicago lines making total actual poundage carried about 611,730.

"Great World Movements" Have Definite Relation to American Business

By Edward Prizer

Chairman, Vacuum Oil Co., New York

Delivered before 25th Anniversary Meeting of National Petroleum Association, Atlantic City, Sept. 15

EDWARD PRIZER

GET away from thinking only of oil for a few moments and listen to Mr. Prizer, world traveler for many years and student of human peoples, give his observations of his last trip around the world, from which he only recently returned to this country.

Great forces are being awakened and destinies of nations worked out, all of which seem remote from possible influence on industry in our own country. Yet 50 years may see a very definite effect on our civilization, is his opinion.

IT WAS my privilege this year to make a trip around the world, sailing East through the Mediterranean. I visited 25 different countries and stopped at 37 ports. While it would be idle to claim that a trip of this character permitted sufficient opportunity for a real analysis of existing conditions, previous business contact of many years standing with the countries visited enabled some conclusions to be drawn from even hasty observation.

Although my remarks will not bear essentially upon the petroleum industry as a whole, they may not be inopportune or out of place at a convention of this character, because the great world movements now everywhere evident have a very definite relation to the future, not only of all forms of business enterprise, but of our present-day civilization. It is wise for us to take a broad view, not alone as relates to the immediate present but of what may happen in the next half century, which as time goes is a very short period in the history of human development.

WE HAVE in this country only a vague appreciation of the numbers of dark-skinned people who populate the world, although we have our own problem, since fully ten per cent of our population is black and the total is steadily increasing. From the time our ship left Italy until we got to the Pacific shores of this country, we were among dark-skinned races in whose hands ultimately the fate of the countries they populate must rest.

No accurate census of the world's population can be taken, but the best authorities estimate a total population exceeding one billion eight hundred million of whom more than three-fifths are dark. What is happening among these peoples is of vital importance to the European nations, which have been largely in control for many years.

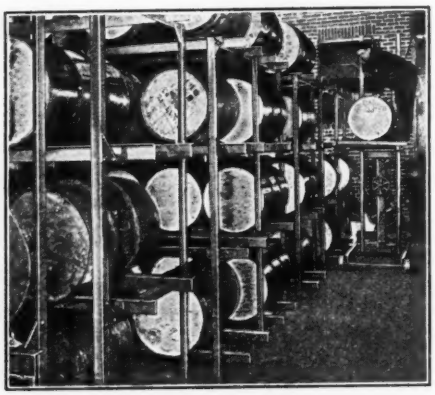
One strong conclusion forced upon me during my trip is that there exists great unrest among these hitherto submerged races, and a spirit of nationalism has been aroused which cannot be repressed but will move steadily forward. The great war had a very disturbing and far-reaching effect among the Far Eastern peoples, and caused not only loss of confidence in, but a more or less definite contempt for Western civilization. Large groups of people have come to the conclusion they are able to handle their own affairs in a much better way than the method which brought about the great war among peoples of supposedly higher civilization.

THERE has always existed in the Far East a definite pride of race, but this feeling is being accentuated by native leaders and teachers, who point out the fact that they had an existing civilization and a certain prosperity when Europe was still to a large extent in a state of semi-barbarism. It was this spirit of nationalism which turned Japan from a hermit kingdom to a world power, and which is now seething in China with a final outcome more or less undetermined, but with the certainty that European domination ultimately will be cast off.

We hear much about the Nordic strain, but there are racial strains in the Far East equally evident and persistent. One of them is the Chinese, for that strain has absorbed into itself all the influx into China of other peoples in the past ages, and wherever the Chinese go their racial strain continues and they secure local dominance. Their capability, industry, frugality and honesty are making them the traders of the Far East. Give to the Chinese a stable political organization and reasonable unity of purpose, and a great Asiatic empire in the Western Pacific is among the future possibilities.

It is true that many of these Far Eastern countries still under European control are not ready for self-government, but their aspirations are for it and as time goes on cannot be controlled. The future certainly points to a loosening of European control, and what this portends is one of the serious problems our early posterity will have to face.

ANOTHER observation which even the casual traveler cannot escape, is the pressure in Far Eastern countries of the population on land areas and food supplies. The Far East is densely populated and rapidly increasing. There is everywhere lack of room. Vast numbers of people live at starvation's edge, and they are beginning to feel that this condition is out of joint with the total world's wealth, and are casting about for some method of improvement. The great epidemics and the more or less constant wars which in the past ages swept over various countries and acted as a check upon undue increase of population, are now under control, and if there is now added to this a decline in infant mortality the pressure of population



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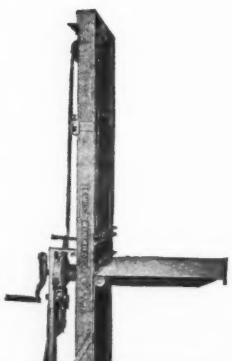

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National Petroleum News

802 Caxton Bldg., Cleveland, Ohio

in these thickly settled countries will become unendurable.

We do not realize how the control of disease is affecting universally the multiplication of the human race. Until the discovery of preventative medicine, which is only of comparatively recent date, disease in recurrent waves carried off millions of the world's inhabitants. In the Fourteenth Century 25 per cent of the population of Europe fell victims to the black death, and this was only one of the epidemics which followed each other at more or less frequent periods from the beginning of history. It was the prevalence of the plague in the Roman Empire which gave the Lombards their easy victory at the time of their invasion. Disease as a restraint to increase of population is becoming less and less a factor, and with the inherent proclivity of Oriental races to multiply, the question of food is a real problem which looms in the very near future.

IT MAY seem strange at this present moment, with a surplus of food in the United States, to think that not far in the future the world must produce more, or reduce its population, or go hungry; but only a short time ago Secretary Hoover made the statement that in a comparatively few years the population of the United States would reach one hundred and twenty-five million, and that it was necessary now to consider the problem of bringing into productivity the waste lands in this country. When we look at the situation in some of the Far Eastern countries the matter assumes an alarming aspect.

The Island of Java is no larger than the State of New York and much of it is mountainous. When it came under Dutch control it had a population of perhaps five million, but today has a population of thirty-seven million and steadily increasing due to the wonderful work done by the Dutch in agriculture and sanitation; but already almost every available foot of ground in Java that is possible for cultivation is growing food. If the population continues to multiply the land cannot feed them. Some of the nearby islands, such as Sumatra, are already forced to import food products.

The situation in India and China, with their teeming millions, and even in Japan, is one where place for their population and food to sustain them are matters of very grave concern. Where can all these overflowing peoples migrate to, and what will be the disturbance in the future from over-population and food shortage. Certainly the answer will have to be found somewhere and it may involve disturbances that will upset races and countries to an extent that cannot be foretold.

It is not alone in the Far East

where pressure of population is a cause for apprehension, but it exists also in Europe. It is believed by reputable economists that the roots of the great war were found in excess of population in given areas, and nationalistic movements were based upon the need of expansion of territory. Although it is estimated that the total fatalities of the war amounted to ten million lives, a comparatively short time will replace these losses, and already certain European countries are feeling the stress of more people than their land or economic conditions can care for. It has been stated that, at the present rate, the world is doubling its population each 60 years, and this increase will outrun the ultimate possibilities of room and food.

THE visitor to the Far East cannot fail to be impressed with the racial and religious animosities which exist. Biologists have never been able to explain the multiplicity of races and it requires more than the tower of Babel to account for the complexity of tongues.

In the Philippine Island group, which stretches along for more than 1200 miles, it is claimed that there are quite 100 different languages and dialects in existence. Conditions fairly parallel exist in many other countries, and they militate against the unification of the populations. However, there is everywhere some dominant type which takes unto itself leadership, and as time goes on more and more largely controls, particularly as education becomes more general. None-the-less racial hostilities are a serious deterrent to general advancement, but as greater contact between the various races takes place, racial dislikes and disagreements will slowly abate.

Religious differences, which to a certain extent are also racial, are of vital importance. Mankind has always been a religious animal and from the beginnings of his intelligence has sought some supernatural explanation of the mysteries of life and the vagaries of nature. There has grown up therefore a great variety of religions which have a tremendous hold upon the peoples of the Far East, and have a very positive influence upon their habits of life and prospects for advancement.

Mohammedanism, because of its simplicity, freedom from theological complexities and promise of a happy future, has a great hold on a vast number of people and is spreading rapidly, particularly among the African races. Christianity meets with small success among Mohammedan peoples. Hinduism, while containing certain lofty principles, has degenerated into fanatical rites and ceremonies which are frequently debasing, and, on the whole,

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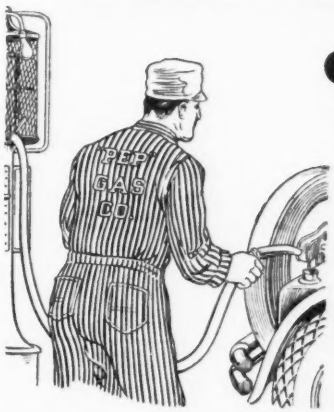

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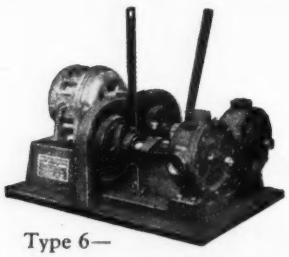

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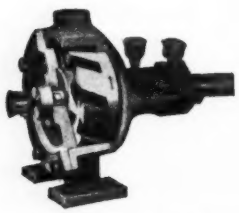

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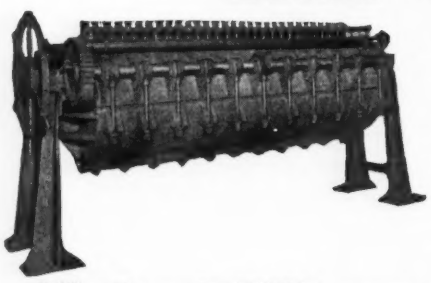

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harmful to both mental and physical advancement.

The rigid caste system, so generally accepted, stifles hope of a beneficial change as relates to this life and bases expectation on the anticipation of a more favorable reincarnation. Christianity among Hindus finds its best appeal among the vast number of so-called "untouchables," who are the lowest in the Hindu human scale.

The serious situation in India is the acute antagonism between Hinduism and Mohammedanism. Two-thirds of the Indian population are Hindus, but as a whole they are a less vigorous type than the Mohammedans, particularly as relates to the hill types observing the latter faith. Were the English to abandon India to its own control it is evident that distressing disturbances between the followers of these two religions would quickly follow. As it is, the English are obliged frequently to intervene to keep the peace between contending religious factions.

In China the worship of ancestors holds people in bondage to forms and practices which seriously prevent the opportunities for genuine social and industrial progress. One of the noticeable things in traveling through China is the multitude of graves dotting the landscape, with bits of paper, colored or otherwise, fluttering at their tops. These graves, located on the property of their descendants, are the seat of stated religious ceremonies and occupy an undue proportion of the arable land. They most seriously interfere with the laying out of railways and highways. To most of the Chinese a proper grave of this character, with descendants to observe ancestral rites, is a matter of very deep importance.

China has been a hopeful field for the Christian missionary, but some recent developments since the Chinese warfare broke out, have led to a question as to how firm a foundation Christianity has secured among the Chinese people as a whole.

It is hopeless to expect that through exterior pressure these Eastern religions can be broken down, but in time it is reasonable to believe that the best which they contain will increase in influence and the worst features will abate, though such an expectation is still a long ways in the future. Not only education but the spread of modern medicine is accomplishing much in this direction, and the medical missionaries of the Christian denominations are having through the services they render a definite and hopeful influence.

WHAT is the attitude of these Oriental peoples toward the United States? It seems to me it is a fair statement that it is no more cordial than the feeling existing at the present time in Europe. We are not beloved abroad. There is a more or

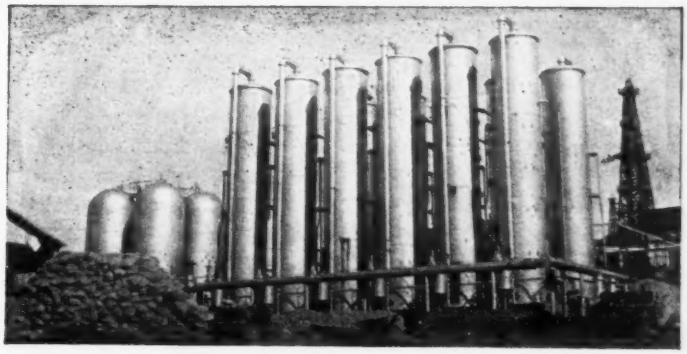
less general belief that somehow the great prosperity of our country is secured at the expense of other countries, and that it is some sinister power or influence that draws to the United States the wealth of the world.

THESE Oriental peoples can visualize a vast population industriously working for a livelihood, because such constitutes their surroundings, but they are unable to visualize more than one hundred millions of people, homogeneous in habits and character, speaking the same language, and trading freely over a continental area without let or hindrance in the way of trade barriers that prevent the free exchange of products of the soil or mechanical effort. They cannot even dream of workmen going to their jobs in motor cars. Therefore, such stories as come to them of American prosperity carry a sense of mystery.

Two fundamental policies of the United States in which no change is likely to occur are deeply resented. They are the tariff and immigration policies now in force. They cannot understand why a country so rich should find it necessary to erect so high a tariff wall to keep out the products of the rest of the world, and also why a country with still so much room should debar an opportunity to other peoples living in such a state of congestion. They believe our policies are based upon selfishness rather than upon the principles of self-preservation, which actually are our impelling motives. It is not alone, however, these policies in themselves which cause ill feeling, but in the way they are administered. The pin-pricks of occasional bureaucratic decisions which seem harsh and unfair add to the sense of injustice which, whether right or wrong, they hold against the policies themselves.

There is also a feeling among the more intelligent that the United States in dealing with its Allies in connection with the loans made during the great war is harsh and severe, and, by imposing such heavy financial burdens on European countries for repayment, is preventing a flow of wealth in trade and commerce to other countries. They look back to the conditions that were hopeful and improving before the war broke out and do not realize that the poverty of Europe is not to be found in its obligations to the United States. However, since it seems to them evident that the United States does not need for its prosperity and progress the payment of these great sums from European countries, they fail to understand why payment should be required when it interferes with and restrains the prosperity of the world as a whole.

The assumption so common in the United States of a virtue superior to that of all the rest of the world, and that measures of uplift should be im-



Phenomenal Increases in Production of Natural Gasoline

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Case	*Production previous to change	*Production after change	Case	*Production previous to change	*Production after change
A	8,600	13,100	G	6,300	7,400
B	19,300	26,000	H	5,900	6,500
C	11,500	20,000	I	56,000	63,000
D	10,000	11,900	J	2,900	3,500
E	6,000	7,100	K	4,300	5,100
F	8,000	8,900	L	5,200	6,100

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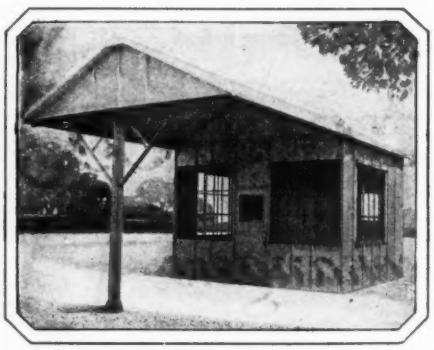

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posed upon other peoples, are not welcomed but on the contrary resented. Our effort to enforce prohibition meets with more ridicule than praise, and the talk of inducing the rest of the world to accept the same principles receives a cold indifference.

I was interviewed at many ports by newspaper reporters and one of them while going up on the train to Bangkok, in Siam, after numerous questions, asked me that now I was out of the realm of prohibition what was my favorite drink. When I answered "water" he gave me a look of unbelief, but none-the-less duly recorded my statement in the evening issue of the Siamese newspaper.

What are the prospects for the increase of consumption of petroleum products among the teeming millions of these Oriental countries? Looking into the future I believe they are very great. Improvements in living conditions slowly are being brought about and with them comes the desire for the things that make life so much more endurable in other parts of the world. Whether the demand is for light, or power, or movement some product of petroleum is a necessity.

The automobile more than any other single present-day invention is bringing about a change in the habits and outlook of the peoples of the whole world. When transportation was limited to the camel, the bullock or the human foot, communities near to each other were strangers, but rapid transit, where it exists, breaks down isolation and removes antagonisms and suspicions. I was surprised to note in Egypt, for instance, how largely the natives had taken to the automobile and the tractor. This desire is everywhere evident and it is held in check only by the poverty of the people. There were none of the Oriental cities which we visited where motor cars were not emphatically in evidence, and their use outside of the cities was impelling the construction of suitable highways.

IN a number of the countries we visited extensive plans were already under way for creation of highways that would permit of comfortable and satisfactory automobile traffic. Give to these peoples any reasonable prosperity which would enable them to use motor transportation as against present methods, and there would be an enormous increase in its use.

The day of rapid transit has arrived as a universal proposition, and there is no more reason to expect any less serious hold upon Oriental peoples than peoples elsewhere, and its beneficial influence will be more marked among them than among the citizens of other parts of the world, who have not so seriously suffered from isolation. Some day China will awake to the need of proper highways, which now

do not exist, just as Japan has done, for Japan is planning for development of highways which will make the automobile as available for country as it now is for city use. It would be unreasonable to expect that any such rapid development in method of transit as has occurred in this country could take place in the Orient, but in a proportionate degree development is certain. There is every just cause to anticipate, as time goes on, that the flow of petroleum products to the Far East will greatly increase.

WE OF the older generation, who are beginning to face the sunset, and who have seen so much take place in our span of years, cannot help speculate as to what all the turmoil and strife in our present restless world will ultimately bring about. I am a believer, however, in mankind, and have faith in the ultimate advancement and improvement of humanity. Evolution is always harsh and may be severe upon individuals, but it makes for the improvement of the race.

The influence of the United States is a tremendous factor in the advancement of the rest of the world, although perhaps more indirect and unconscious than intentional. What we have accomplished, may cause certain suspicion and envy, but other peoples are seeking the same results, not alone as to physical prosperity but as to education and moral advancement. We are recognized as lovers of peace and the most idealistic and generous people which exist, and I believe that underneath all present foreign suspicion and dislike we are an object lesson in progress which will be studied and emulated, and which will make to a vast degree for the common improvement of all peoples.

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CHICAGO, Sept. 9.—Oil Men's special trains over the Frisco railroad lines from St. Louis to Tulsa during the International Petroleum Exposition, Sept. 24 to Oct. 1 inclusive, have been announced by M. D. Riggs, district passenger agent of the railroad. They will run as second sections of the "Meteor", the Frisco's crack train.

Oil men from Chicago and vicinity may make connection with these special trains from either of the four 6½-hour trains from Chicago to St. Louis, leaving Chicago between 11:25 and 11:45 p.m. daily. Some railroads have indicated that they will operate through sleepers to Tulsa from Chicago in connection with the "Meteor". Flat fare from Chicago to Tulsa is $25.44, lower berth is $8.25.

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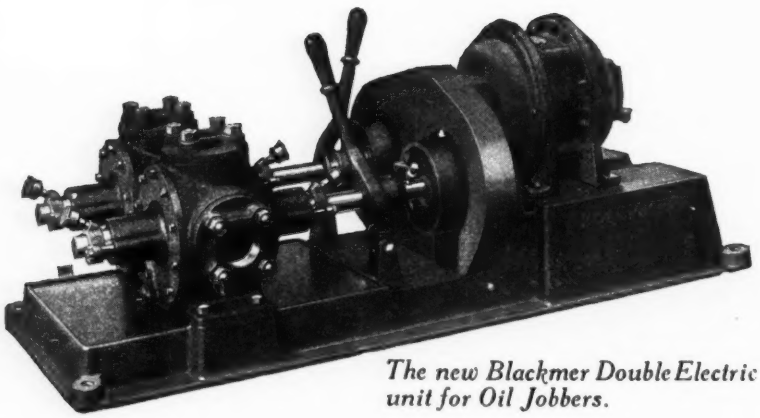

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Two Weapons for the Refiner to Use In Combating Heat Losses

By Donald F. Gerstenberger

Article III

IN THIS day of close margins on profits, high cost of construction and comparatively high cost of fuel, which must be so extensively used in a refinery, the heat exchanger plays no small part in helping to keep the refinery on the profit side of the ledger. In many operations it is actually an essential to the operation itself. Heat exchangers have many and varied uses, sometimes combined uses. In addition to accomplishing what their name implies, they may be used to assist in fractional condensing, as coolers, or as an indirect means of distillation.

Practically every refinery operation has any amount of waste heat, which can be harnessed to a certain extent to assist greatly in efficient and economical operation. To be sure, a great deal of such waste heat is low temperature heat, and a sufficient amount of surface to gain much advantage is rather expensive in first cost, but we are still wasting so much heat by condensing vapors, or cooling condensates, that the writer feels there is still room for considerable application of the economic principles of the heat exchanger.

On the atmospheric distillation, the heat exchanger can be used as a means of preheating and also for condensing. On the cracking operation it can be very successfully used to combine practically all of its advantages. Tower temperatures, or fractionation, may be controlled, light ends may be eliminated from the feed stock by pre-heating it, and fuel economy is attained. Such exchangers are usually played over the tower which takes care of the fractionation of the heavier gas oils, which are to be returned for further cracking. The vapors leaving the tower come into contact with the incoming fresh feed stock passing through the exchanger, and the quantity of feed stock is varied slightly, as is necessary, to maintain a certain vapor temperature at the exchanger outlet. The preheated feed stock passes thru a residue exchanger, and joins the condensate from the base of the heavy tower in a hot feed tank, which supplies oil to the feed pumps for the cracking still.

THE type of exchangers best adapted to this work are those that do not require too high a velocity of either oil or vapor, for a high temperature feed stock for the cracking still is desirable. Consequently the exchangers must be considered from the view-point of pre-heating as well as cooling,—the problem being one of removing a definite number of B.t.u. with a given quantity of oil. It were better to have this equipment designed so that the actual quantity of feed stock necessary to cool the vapors is insufficient to feed the cracking still, rather than have an excess of pre-heated feed stock. By installing exchangers that can be used or by-passed as desired to preheat the feed by exchange of heat with some of the condensates, or exhaust steam, prior to its entry to the heavy tower exchangers, such deficiency can readily be overcome, at the same time both vapor control and preheating are made quite flexible. With proper exchanger installations along these lines it is possible to attain close to a 600° feed stock for the cracking still.

THE story of exchanger installation on other equipment, would be more or less along the same line, but will be taken up in detail in a later article. The amount of fuel saved, and the possible increased capacity where such equipment is in use is apparent.

The exchanger can hardly be considered a piece of fractionating equipment, and yet can aid considerably in fractionation. The condensates from the vapor exchanger assist in good fractionation, if cut back to the tower from whence they originated, as this oil will be re-vaporized and recondensed many times before finally being separated into its desirable fractions. Also, by this method of handling, the necessity of "planing" in a great many instances is eliminated. The use of the exchanger should always be considered with a view to pre-heating the incoming oil to as high a temperature as possible, the cooling of the pre-heating medium being secondary.

A good example of this is given from a certain rerun operation. With a definite amount of feed stock and bottoms on this operation, it was possible to cool the bottoms to 120° and pre-heat the feed to 150° by use of an efficient exchanger. By preheating the feed stock with exhaust steam, prior to its entry to the bottoms exchanger, and not going to an amount of surface in the exhaust steam pre-heater which would call for an excessive first cost, it was possible to pre-heat the feed to 200°, and the bottoms were cooled to 185°.

The advantage to the operation was plain, regardless of the fact that the bottoms had to be further cooled with water. The low temperature heat remaining in the bottoms would require extensive surface to pick up additional heat to any advantage, whereas a comparatively small amount of surface in the water box sufficed to do the remainder of the cooling. Yet the amount of fuel saved by the increased temperature of the feed stock was considerable, and in this particular instance, the capacity of the rerun battery was decidely increased.

ONE of the large seaboard refineries built a steam still. To the refiner of today the steam still, without the aid of fire, means high cost of operation, that is, the usual steam still. Yet in this entirely modern

Waste Heat Big Source of Loss

USE of heat exchangers and automatic temperature control apparatus offer the refiner and his operating staff a means to combat the great losses which are otherwise bound to occur in operations in which heat is used in so many forms and places.

This Gerstenberger article points out some of the points to be considered in use of heat exchangers and gives concrete examples of the saving they bring the refinery. Likewise, because of the desirable close regulation of temperature in many operations, automatic control apparatus offers the refiner opportunity for large savings.

The absorption plant in the refinery as a piece of equipment that more than pays its own way will be the subject of Mr. Gerstenberger's next article.

plant a steam still was erected. It lacked all the appearances of the usual steam still, and in fact, one would hardly recognize it as a still at all unless so informed. It is almost safe to say that the only heat lost was that lost by radiation. This may be slight exaggeration, but it closely approaches fact. The low temperature heat, picked up in the cooling of the condensate, was utilized to pre-heat boiler feed water. The condensing and some cooling was done by exchanging the vapor heat into the incoming fresh naphtha feed, so that a high percentage of the distillation was the direct result of this heat pick-up. As a result, the amount of steam used was exceptionally low. The condensing and cooling equipment for this still was nothing other than a series of exchangers, each one designed for its particular service.

SUCH operation is not simple. The exchangers must be designed to perfection. Leaks will contaminate the over-head products, and for this reason, a great many refiners will not consider this type of construction. Yet it is possible to design an exchanger which will be efficient, and in which the chances of contamination will be very remote. In some cases the first cost of such equipment may be prohibitive, but there should also be considered what is possible in economy by the use of the heat exchanger. Our present day operations have a great way to go yet in taking advantage of this kind of equipment, both for efficient and economical operation.

Residual exchangers make an ideal means of obtaining high temperature heat, and consequently are a great aid in distillation as well as fuel economy. The steaming water box of the residue cooler means perfectly good dollars evaporating into the air. With heavy viscous residues we must sometimes be content to see a certain number of them take wings, as it were; but there are any number of operations in use today where a great deal of precious heat wasted at this point, could be advantageously used. If in no other way, some of it provides ample means of evaporating good water from bad, to make suitable boiler feed water. But usually, a good amount of this heat can be used in the operation itself. Where, due to the consistency of the residue, it is essential that it does not become cooled below a certain temperature, it is sometimes desirable to preheat the feed stock with exhaust steam or vapor heat exchangers to this desired temperature, prior to passing it through the tar heat exchanger. Thus the danger of plugging the exchanger with heavy tar is eliminated.

Hand in hand with vapor heat exchangers go automatic instruments for the control of the vapor temperatures. It is invariably desirable to regulate these temperatures to a close degree to prevent carrying over undesirable fractions. There is practically no operation where the vapor temperatures will vary, if not properly controlled. More variation is usually experienced in the cracking operation than in others, due to continual change of vapor velocity, but a variation exists in practically all distillations to a greater or lesser degree. Here the automatic temperature control plays an important part. The vapor temperature is maintained by a slight increase or decrease in the flow of liquid used as a cooling medium. Such control by hand involves excessive labor with poor results. The automatic temperature control, if properly installed and handled, takes care of this condition very nicely, and does it much better than is possible by hand operation.

IT DOES not suffice to simply install this equipment, however, and assume your troubles are ended. For the time being perhaps, they have just begun. Each and every operation must be studied and the control manipulated in such a way as to give the best results. Once this is attained, and the men called upon to handle the controls understand their operation, you will be pleased, and probably surprised with the uncanny way in which they operate.

The writer has in mind a pump-house, housing 10 pumps used in conjunction with the fractionating equipment of a distillation unit in a certain refinery. Each pump was operated by an automatic control. As if operated by some unseen hand, they would speed up, slow down, and stop completely, in a way that, if done by hand, would keep at least two men on the jump continually. One could almost feel the force that governed them. The distillation of the overhead products showed a very uniform result, and vapor temperatures were controlled within a variance of from two to four degrees.

OF COURSE, where the fractionating equipment is too small to properly handle the volume of vapors passing through it, one cannot expect the automatic equipment ot function so closely, but in any event, it will usually be a decided improvement over hand operation and should give improvement in fractionation as well as decrease the labor costs. The writer has seen concrete examples where the installation of the proper control instruments cut the labor cost of a certain operation a cent and a half per barrel throughput.

There are many and varied types of temperature control instruments on the market today, each having their respective merits. If you are satisfied with one type, and your men are familiar with its operation, it is best to standardize on it. These instruments are usually sub-divided into two general classes. Direct acting, and reverse acting. The name has come from the operation of the valve, which governs directly, or indirectly the increase or decrease of the quantity of the cooling medium. The direct acting control is usually set up to operate a control valve in the oil or water line, which is usually set in a by-pass. As the temperature of the vapors lower, the valve opens, allow-

Conclusions

PRACTICALLY every refinery operation has any amount of waste heat, which can be harnessed to a certain extent to assist greatly in efficient and economical operation.

* * *

The heat exchanger can hardly be considered a piece of fractionating equipment, and yet can aid considerably in fractionation. The condensates from the vapor exchanger assist in good fractionation, if cut back to the tower from which they originated, as this oil will be revaporized and recondensed many times before finally being separated into its desirable fractions.

* * *

Exchangers must be designed to perfection. Leaks will contaminate the overhead products. Yet it is possible to design an exchanger which will be efficient and where chances of contamination will be remote.

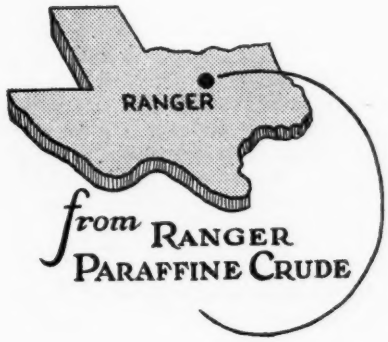
Hand in hand with vapor heat exchangers go automatic instruments for the control of the vapor temperatures. There is practically no operation where the vapor temperatures will not vary if not properly controlled.

* * *

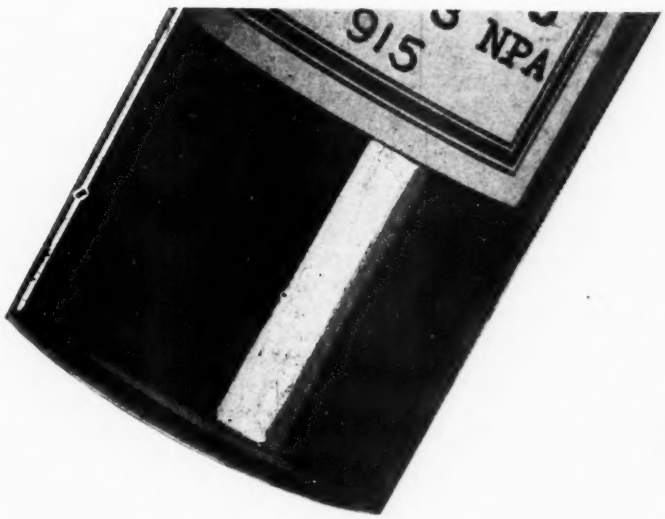
If you are satisfied with one type of temperature control instrument on the market and your men are familiar with its operations, it is best to standardize on it.

* * *

The next few years will witness broader steps in the economic use of both the control instrument and the heat exchanger.



No. 913		No. 915	
Gravity	23-25	Gravity	23-25
Flash	450-460	Flash	490-500
Fire	510-520	Fire	565-575
Viscosity	80-90	Viscosity	120-130
Cold Test	10-20	Cold Test	10-20
Color	7+ NPA	Color	7-8 NPA



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NATIONAL PETROLEUM NEWS

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ing some of the cooling medium to by-pass the exchanger or tower, as the case may be. Its action is reversed as the temperature rises. The reverse acting controller, closes the valve as the temperature lowers, and opens it as the temperature rises, or in other words, the exact reverse of the direct acting control. It is either placed in the steam line to the pump, and there-by governs the pump speed, or in the line through which the cooling medium passes on its way to the tower or exchanger. The writer prefers the pump installation in most cases, because it responds more quickly to temperature change, and is usually more flexible.

Other uses for automatic control instruments are, the firing of stills, and the governing of a definite flow of liquid. Where a control is installed for firing purposes, there must be a maximum and minimum point set for the increase and decrease of the fuel supply. The manufacturers are usually able to provide a control with this feature. Flow meter controls for the governing of the flow of liquid have their uses on the feed pumps of continuous treating plants, continuous batteries of stills, and have been recommended for use on the feed pumps of the cracking still. There is no doubt in the mind of the writer but that the next few years will witness broader steps in the economic use of both the control instrument and the heat exchanger.

Red Crown vs. Red Hat Ding! Round Three

CHICAGO, Sept. 10.—The gong will sound some time next week and the third round of the Red Hat vs. Red Crown fight will be on.

Standard Oil Co., of Indiana, manager of Red Crown, is going to appeal from the Aug. 9 decision of Referee William A. Kinnan, assistant commissioner of patents. United States Patent Office rules allow only a 40-day intermission between rounds so the combatants will have to be on their feet with their mits up by next Saturday, Sept. 17.

Red Crown is decorated with a black eye given by Red Hat in the last round. Red Hat, protegee of Independent Oil Men of America, floored Red Crown for a count of 9 in round two with an unexpected haymaker on the psychology department.

About this time last year, during the first round, the Independents were not making so much noise. They accused Red Crown of having a horse shoe in his glove and predicted a 1927 end point for Red Hat. Red Crown had won the first round. Referee J. Carnes, examiner of interferences in the patent office, deliberated for a long time and finally decided that Red Hat did interfere with the trade mark rights of Red Crown.

Round three is expected to be most interesting. The square ring will be moved to the Circuit Court of Appeals, District of Columbia. The same issues and the same evidence will be taken to the Circuit Court. If Red Hat is able to hold its present advantage the third round may end the matter. On the other hand if Red Crown takes the third, there will be a fourth, because an original court fight will have to take place to prevent I. O. M. A. from using an unregistered trade mark.

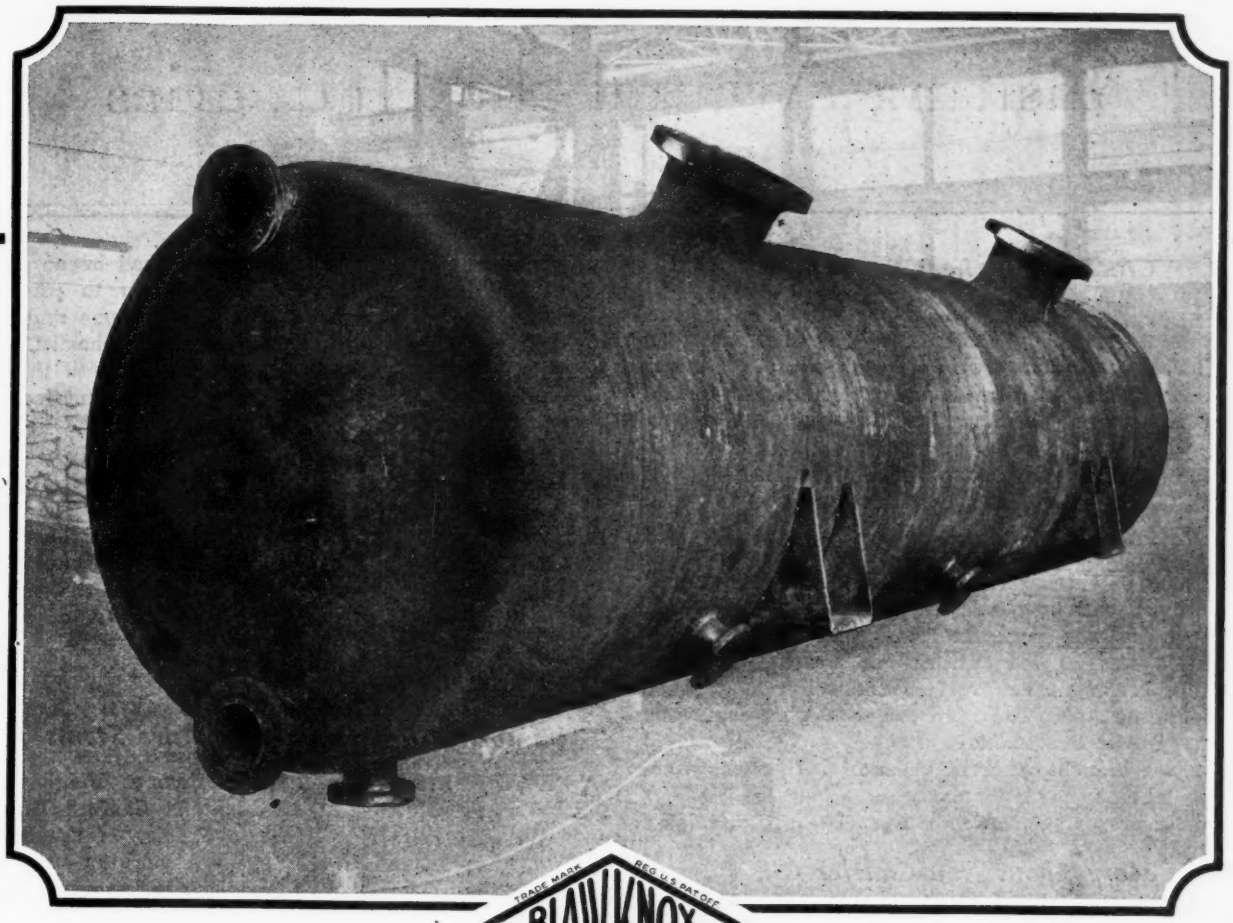
Red Crown was banking on the "head work" of Prof. E. S. Robinson of the University of Chicago who was expected to show by academic research that Red Hat and Red Crown were so much alike that they would confuse the buying public. But his experiments indicated that boys in dog-skin coats shoot craps rather than play poker and could not be expected to distinguish between a king and a jack in the bright glare of a filling station. So Prof. Robinson's exhibits in experimental optics got the air and Commissioner Kinnan decided that concentric circles and red paint antedate the petroleum industry and both litigants have equal right to use them in advertising.

Officials of 3 Companies Inspect Gas Line

TULSA, Sept. 10.—The 20-inch gas line now being built by the Empire companies from Pampa, Texas, to Wichita, Kans., is being inspected by a party of officials of Empire, National Tube Co. and Oil Well Supply Co., to make a close examination of pipe already laid and to study methods used in laying it. Pipe on hand along the line also will be inspected by the party. About 100 miles of the west end of the line have been laid.

Those in the party are F. J. Petura, general purchasing engineer, Cities Service Co., New York; G. A. Tompson, purchasing agent, Empire Companies, Bartlesville; T. D. Davies, assistant to vice president, National Tube Co.; J. B. Graham, assistant to Mr. Davies; M. L. Moore, assistant to the president, Oil Well Supply Co.; R. C. Stametts, manager tubular goods department, Oil Well Supply Co., all of Pittsburgh; B. L. Harris, Oil Well Supply Co., Bartlesville; and Byron Post, Oil Well Supply Co., Tulsa.

TULSA, Sept. 10.—Dr. G. G. Brown, head of the research department of the Association of Natural Gasoline Manufacturers, will be the guest of the California Natural Gasoline Association at a meeting to be held this fall. Dates will be fixed by the California association. Approval of the western trip for Dr. Brown was given by the directors of the Association of Natural Gasoline Manufacturers this week on recommendation of the educational committee.



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Visiting Around the Refineries

By Paul Truesdell

National Petroleum News

Cracking in the Vapor Phase

IT IS safe to say that all of the big refining companies and probably some of the smaller ones that have technical staffs are working hard to develop economical processes for producing motor fuels by cracking in the vapor phase without pressure. Wherever two or three oil technologists got together at the recent meeting of the American Chemical Society in Detroit, the conversation was likely to turn to vapor phase cracking.

Some chemists were almost ready to offer bets as to how long it will be before present liquid phase cracking processes will be obsolete.

While there was much talk about the subject, little information was handed out because most of the companies are keeping their experimental work under cover. High operating losses has been one of the major factors that has proved a stumbling block to rapid advance of vapor phase cracking. It is understood that one company at least is in a fair way to solve this problem through the proper application of heat exchange principles.

More About Non-Chatter Oil

NO MATTER whether the new car Mr. Ford is going to bring out is a gear shift car or not, there will still be several million of the old planetary transmission Fords still on the road for a long time to come.

And some of them will chatter.

The chief chemist of a big oil company told me at Detroit that Pennsylvania oil, used consistently, will eliminate chatter in a Ford car. With all the talk there has been lately about non-chatter oils, this chemist caused an elaborate series of tests to be run in his laboratory.

He stated his tests showed that if new bands were put in the car, Pennsylvania oil used exclusively and changed about every 500 miles, the bands would never chatter. He accounted for this with the suggestion that it is the asphaltic material in lubricating oil generally that forms the glaze on the bands that makes them alternately slip and grip and that Pennsylvania oil is notably free from such substances.

About Gum in Cracked Gasoline

ANOTHER story I heard in Detroit shows the damage that may be done and the expense that may be caused by failure properly to treat cracked gasoline for the removal of gum forming compounds. It is too bad that no means can be used in this but here is the story.

A big refining company that sells a large amount of cracked gasoline shipped to one city where it has large distribution, about $300,000 worth of cracked motor fuel. Either through a slip or because somebody decided to try the experiment of marketing such gasoline untreated, the usual treatment was omitted.

After this shipment of gasoline was in the bulk station tanks and its sale to the public had begun, complaints of stuck and burned valves began to pour in from the motorists. A hurry call for help was sent out by the refining company to a distinguished chemist. He rushed to the seat of the trouble, together with the refinery chemist. They found the gasoline contained a high percentage of gum forming compounds.

It seemed that the only thing to do was load the stuff in tank cars, ship it back to the refinery, some hundreds of miles, treat it and ship it back. The best estimate was that this would cost in the neighborhood of $100,000. The two chemists got their heads together and devised a method of treating it on the ground that would let the company out with a cost of about $4,000.

This is kind of a blind story but it shows what may happen.

Lubricating Automobile Valve Stems

AT LUNCH the other day with Thomas Midgley Jr., discoverer of tetraethyl lead, and Sanford Brown, president of the Halowax Corp., a division of the Bakelite Corp., in Detroit, the talk turned on the value of lubricating automobile valve stems to prevent their sticking and burning, and on the virtues of halowax oil as a valve stem lubricant. Halowax oil, which is another name for monochlorbenzene, is used in large quantities in the manufacture of photographic film.

Mr. Midgley said that the custom of putting a pint or so of lubricating oil to 5 gallons of gasoline into the gasoline tank of new cars is a sound one and that it would be a good thing to do right along except for the fact that the oil would deposit excessive carbon.

During the early development of Ethyl gasoline, some trouble was met from sticking and burned valves because of the fact that the burning of the Ethyl gasoline-air mixture tended to dry off the oil from the stems of the valves and caused them to stick. This was finally remedied by putting a small percentage of halowax oil into the Ethyl fluid.

Halowax oil has exceedingly great lubricating value and it sticks tenaciously to the valves. When burned it does not deposit appreciable carbon. Midgley's idea was that refiners who would buy halowax oil and mix it with their gasoline in very small proportion before shipment, would be rendering a service to the motorists who finally used the gasoline by preventing any chance of sticking valves, and it would cost the refiner very little.

Two More Cracking Patent Suits

UNIVERSAL OIL PRODUCTS CO. on Sept. 1 filed suit against the Standard Oil Co. of New York, claiming that by operating the Cross cracking process it is infringing 13 patents owned by the Universal Oil Products Co., according to J. G. Alther, secretary of the Universal. Mr. Alther also says his company has sued the Lemont Refining Co., Lemont, Ill., charging infringement in its operation of the Donnelly cracking process.

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☐	☐	Mid-Continent Motor Oils	☐	☐	Canfield Press-Sure Lubricant
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☐	☐	Zero Oils	☐	☐	Fibre and Sponge Grease
☐	☐	Black Oils	☐	☐	Gear Shield
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To Keep Gasoline Stocks from Piling Up Is Mid-Continent's Problem

By J. C. Chatfield

TULSA, Sept. 3

WITH two thirds of the year gone it is apparent to the Mid-Continent refining industry their gasoline sales for 1927 will not show the normal increase over 1926. The good increases in business of the early months of the year have been nearly wiped out by the unsatisfactory summer gallonage.

Recently it has become certain that Mid-Continent refiners will be forced to keep their crude runs at an even lower level than the last four months of 1926 if they expect to keep their gasoline stocks from piling up to an uncomfortable height.

All businesses which depend to a large extent on weather for patronage are in the same boat, if that is any comfort. The management of Coney Island, for example, recently complained that its income was some seven million dollars short as a result of 10 rainy Sundays in a row.

The long distance weather prophets who predicted that 1927 would be the year without a summer were at least partially right. Tulsa is pretty well south and has a good bit of hot weather during June, July and August. Often the temperature climbs above 100 every day for several weeks and has been known to go as high as 110 to 112. But this summer the mercury has not passed the 100 mark and amusement parks and swimming pools have had hard sledding to make expenses.

Of course the weather has not been entirely responsible for the failure of Mid-Continent refiners to show a good increase in gasoline gallonage. Competition of other refining districts has restricted the area into which refiners here have been able to ship their motor fuels at a reasonable price. Any shipments into border territory in recent months have had to be made at sharp concessions in price.

SHIPMENTS of gasoline from refineries in the Mid-Continent field which are covered in the weekly reports by NATIONAL PETROLEUM NEWS up to Aug. 26 totaled 1,207,830,000 gallons, as compared with 1,122,641,000 gallons for the same period in 1926. This is an increase of 85,189,000 gallons, or 7.6 per cent.

During the first 17 weeks of the year total shipments from the plants mentioned were 557,516,000 gallons, as compared with 494,987,000 gallons the first 17 weeks of 1926. The increase the first four months was thus 62,529,000 gallons, or 12.6 per cent. During the past four months total shipments have been 650,314,000 gallons, as compared with 627,654,000 gallons in the same period in 1926. The increase this year for the second 17 weeks of the year has been only 22,660,000 gallons, or 3.6 per cent greater than last year.

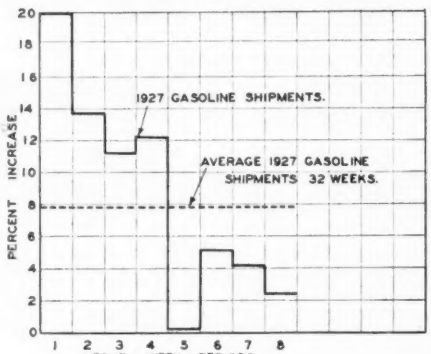

Fig. 1—Percentage of increase in gasoline shipments from 124 Mid-Continent refineries, by four week periods, for the first 32 weeks of 1927 over the same period in 1926, with the average increase over 1926 for the period also shown.

Last year gasoline shipments of reporting plants, which represent about 60 per cent of the operating capacity of the field, were 26.8 per cent greater in May, June, July and August than in the first four months of the year. This year shipments have been only 16.6 per cent greater in the past four months than in the first four months of the year.

Cumulative Shipments of Gasoline from Mid-Continent refineries covered by weekly reports gathered by National Petroleum News. Figures in gallons.

Total Weeks	1926	1927	% Increase
1	23,888,000	30,364,000	27.1
2	52,798,000	64,924,000	22.9
3	78,486,000	95,893,000	22.2
4	103,518,000	124,348,000	20.1
5	129,109,000	154,562,000	19.7
6	157,743,000	183,678,000	16.4
7	184,890,000	215,320,000	16.4
8	211,571,000	247,196,000	16.8
9	238,942,000	281,012,000	17.6
10	270,297,000	313,150,000	15.9
11	298,519,000	346,222,000	15.9
12	330,714,000	379,694,000	14.8
13	363,475,000	419,406,000	15.3
14	393,184,000	454,815,000	15.7
15	425,285,000	488,250,000	14.8
16	456,831,000	521,223,000	14.1
17	494,987,000	557,516,000	12.6
18	533,259,000	592,968,000	11.2
19	569,482,000	631,551,000	10.9
20	604,109,000	668,778,000	10.7
21	641,038,000	706,565,000	10.2
22	674,936,000	742,663,000	10.0
23	709,662,000	780,436,000	9.9
24	747,453,000	819,441,000	9.6
25	783,792,000	856,276,000	9.2
26	822,852,000	895,792,000	8.9
27	857,552,000	934,290,000	8.9
28	896,651,000	974,972,000	8.7
29	936,074,000	1,014,564,000	8.4
30	976,430,000	1,055,279,000	8.1
31	1,011,747,000	1,092,274,000	7.9
32	1,049,073,000	1,130,981,000	7.8
33	1,084,667,000	1,168,902,000	7.8
34	1,122,641,000	1,207,830,000	7.6

CUMULATIVE gasoline shipments of the 124 reporting plants by weeks for this year and last with the percentage of increase are given in the accompanying Table No. 1.

An accompanying chart, Fig. 1, shows the declining percentage of increase in gasoline shipments by four week periods. In the first four weeks of the year gasoline shipments were 20.1 per cent greater than in 1926. In the second four weeks shipments were 13.7 per cent greater than in February, 1926. Another drop to 11.2 per cent was shown in the third period of four weeks but a slight gain to 12.2 per cent was maintained in the fourth period.

During this first four months period Mid-Continent refiners were keeping their gasoline shipments at a high level partly by enlarging their distributing area. Anticipating lower crude prices most of the time, refiners were pushing their gasoline into Indiana, Ohio, New York, Pennsylvania and other states where they find it impossible to meet current competition.

During the fifth period of four weeks ending May 20 refiners reporting to NATIONAL PETROLEUM NEWS showed gasoline shipments only 0.2 per cent in advance of the same period a year ago. In June the increase rose to 5.1 per cent and then dropped to 4.2 per cent and then to 2.4 per cent for the four weeks ending August 12.

Normally it may be assumed that about 65 per cent of the gasoline shipments of Mid-Continent refineries will be made in the first eight months of the year and 35 per cent in the last four months. In 1926 shipments in the first 34 weeks were 64.6 per cent of the total for the year.

If it were possible to assume that gasoline shipments would be normal this year in the next four months the total for the year might be expected to approximate 1,869,000,000 gallons, an increase of 7.6 per cent over 1926. Shipments for the next four months on that basis would be 662,000,000 gallons as compared with actual shipments of 614,556,000 gallons in the last third of 1926.

From the evidence shown in Table No. 1 it is much more probable that shipments in the next four months will not show an increase of 7.6 per cent over 1926. It is more logical to assume that conditions of the past four months will more nearly prevail. On that basis total shipments of the 124 plants may be expected to be about 636,680,000 gallons and the total for the year about 1,844,510,000 gallons, an increase of 6.2 per cent over the total for 1926.

Thus far this year the gasoline yield at refineries reporting to NATIONAL PETROLEUM NEWS has been 43.04 per cent, as compared with 42.14 per cent for all 1926. The increase in yield in spite of the decrease in percentage of cracked gasoline manufactured, was made possible on account of lighter crudes with a larger percentage of gasoline which can be recovered by straight distillation.

On the basis of this yield the group of reporting refiners could run 35,220,600 barrels of crude to their stills between now and the end of the year without adding to their present stocks of gasoline. This would amount to a daily average of 279,500 barrels.

During the four weeks ending August 26, crude runs at reporting plants averaged 290,000 barrels per day. The cut from this average would be 10,500 barrels per day to produce only enough gasoline to meet demands of the market. Runs were cut to 281,702 barrels per day during the week ending August 26, bringing the average for that week down nearly to the level suggested. There is no indication, however, as to whether this may be considered a permanent cut. Quite often runs are reduced sharply at the close of the month and advanced again within a week or so. The wide variation in crude runs from week to week is shown in Fig. 2, a chart showing gasoline stocks, the price of U. S. Motor gasoline and 36 gravity crude and crude runs for the past two years.

A YEAR ago in the last 18 weeks of the year the group of reporting plants charged a daily average of 284,235 barrels of crude to their stills. The result was they increased their stocks of gasoline nearly 21,000,000 gallons. Stocks on August 27, 1926, were 45,837,000 gallons and on Dec. 31 had increased to 66,756,702 gallons. A comparison of the price of U. S. Motor gasoline in Group 3 with the level of gasoline stocks in the Mid-Continent in Fig. 2 will show how the mounting reserves of motor fuels in the last three months of the year affected the market.

On Aug. 26, this year, the most recent report at hand as this is written showed gasoline stocks at 69,897,000 gallons, three million gallons greater than at the end of 1926, and 24,000,000 gallons greater than on the same date a year ago.

If gasoline stocks at reporting plants increase 21,000,000 gallons during the next four months as they did in the same period a year ago, reserves will jump up to over 90,000,000 gallons, a figure which has been reached late in February during the past two years.

In view of the pressure exerted on Mid-Continent gasoline markets by the necessity for cash when inventories of refined products climb to high levels it is apparent that a reduction of stocks below the present level by the end of December would be desirable. In order to accomplish that reduction all figures at hand indicate that crude runs during the remainder of the year would have to be reduced at least 15,000 barrels daily average below the average runs during August.

Curtailment of crude runs apparently is needed to an even greater extent in some other areas in the country than in the Mid-Continent. As a matter of fact it appears that wholesale prices of gasoline in tank car lots have been broken this year by refining groups outside of the Mid-Continent more than by the Mid-Continent operators. Lower priced gasoline has reached jobbers in the Mississippi and Ohio river valleys first from refineries in Wyoming, on the Gulf coast and in the central states. As mentioned previously this keen competition from other refining groups is one of the important reasons why Mid-Continent refiners have not been enjoying their full share of the increase in gallonage actually sold to the motoring public.

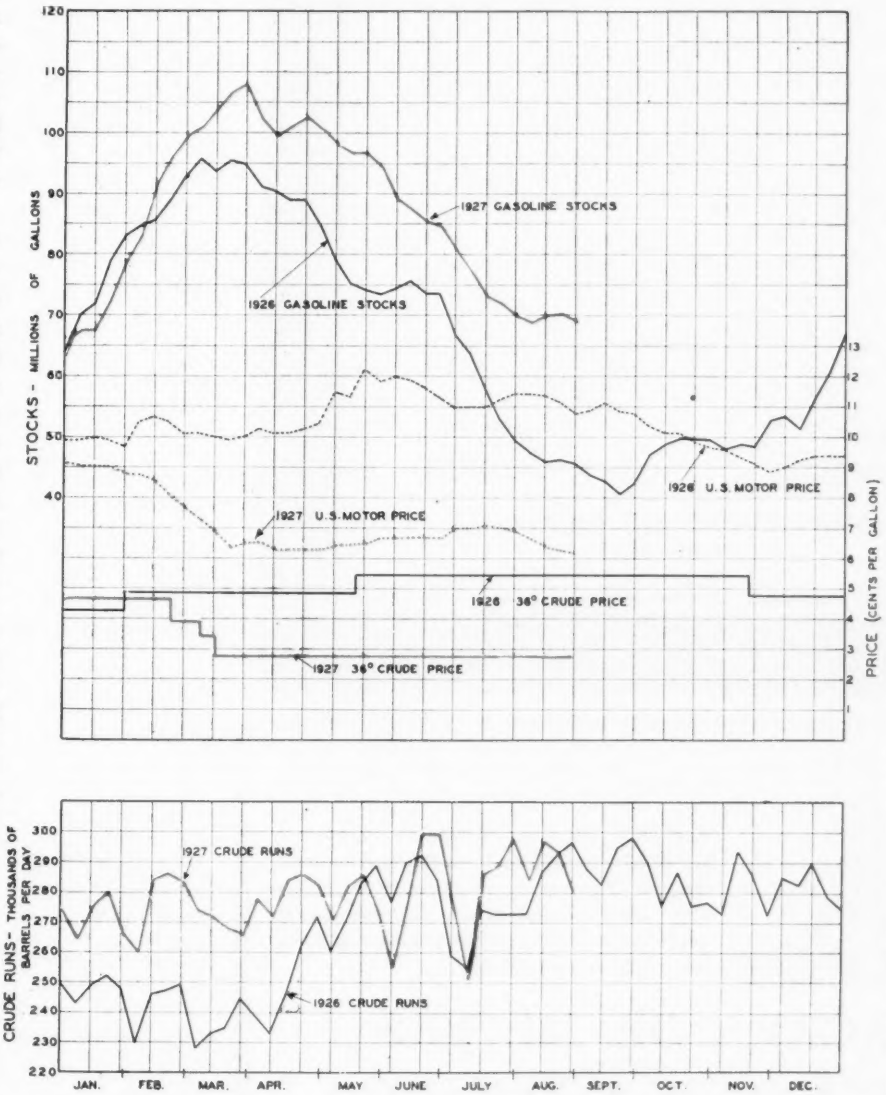
STOCKS - MILLIONS OF GALLONS
PRICE (CENTS PER GALLON)
1927 GASOLINE STOCKS
1926 GASOLINE STOCKS
1927 U.S. MOTOR PRICE
1926 U.S. MOTOR PRICE
1926 36° CRUDE PRICE
1927 36° CRUDE PRICE
CRUDE RUNS - THOUSANDS OF BARRELS PER DAY
1927 CRUDE RUNS
1926 CRUDE RUNS
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

Fig. 2—Chart showing trends of gasoline stocks at 124 refineries in the Mid-Continent field as covered by weekly reports to National Petroleum News, crude runs at these plants, the spot market price in Oklahoma (Group 3) and the posted price of 36 gravity crude oil. 1926 figures are shown and through August in 1927

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Oil Output Helps Swell Minerals Production

WASHINGTON, Sept. 9.—A higher level of production in the mineral industries was maintained in 1926 than in 1925, according to the division of mineral statistics of the U. S. Bureau of Mines, Department of Commerce.

Measured by total value of mineral products, which was $6,262,000,000, 1926 output was the next largest ever recorded. The peak year was 1920, when value was $6,981,340,000, but price levels have so declined since then that the real value of the nation's mineral production for 1926 represents an appreciable increase over 1920.

Contributing to this increase was the new record in crude oil output. Stocks of crude were reduced considerably during the past year, thus reflecting larger refinery throughput and heavier demand for refined products. Output of natural gas, natural-gas gasoline and carbon black also increased in 1926, the report shows.

Other minerals which established peak production were lead, zinc, iron and steel. Prices were slightly lower or about the same for most minerals.

Trico Head Returns From Europe

SISTERSVILLE, W. Va.—E. A. Durham, president of the Trico organization here, which is comprised of the Wiser Oil Co., Petroleum Exploration Co. and the Amity Gasoline Co., returned to Sistersville on Aug. 18 after a two months' tour of the British Isles.

While abroad Mr. and Mrs. Durham attended the marriage of their nephew, Arthur Durham to Miss Edith Sugden of Cleckheaten, Yorkshire on July 27.

During their visit in Scotland they witnessed the dedication of a war memorial by the King and Queen of England. While at Trafalgar Mr. Durham heard the internationally known radical leader Tom Mann denounce the American government because of the Sacco-Vanzetti trial, as well as the English policies of government.

Has Lindbergh Special Day

MOLINE Ill.—The River Valley Oil Co. with the opening of its Central Super Service Station here recently, capitalized on Col. Lindbergh's trans-Atlantic flight by announcing that it would give away as a Lindbergh special a sealed quart can of Gargoyle Mobiloil with every purchase of five gallons of gasoline on the opening day. A half page of newspaper space was used to tell the public about this special offer. Gargoyle Mobiloil was the oil used by Col. Lindbergh on his flight and is now being used by him in his national tour.

Wider Well Spacing Would Cut Costs And Retard Flush Output

By Lawrence E. Smith

IN THE extended discussion that has accompanied the present period of increasing production and falling prices of crude oil and finished products, there has been no especial mention of the one thing that is of primary importance to all those within the industry and the thousands of investors who have entrusted their money to this industry.

There has been little said about the desirability of establishing a program of profits.

The discussion has been pitched upon the key of conservation and the time has been that future generations would be despoiled of their heritage if the present and increasing rate of discovery and extraction of oil were to continue.

Probably the issue would have been clarified if the public speaking and the writing had taken as text the more practical, every-day consideration that after all, those now living and engaged in one way or another in the oil industry are seeking and are entitled to fair reward for their efforts.

It is obvious that no immediate benefit could be had from the enactment of any law, no matter how wisely drawn. The best of the legal talent in the industry subscribes to the opinion that only the several states can function in this matter, that the federal government possesses no authority in the matter. To establish a sound supervisory policy in all of the oil producing states would be a labor of years.

What is required is a re-shaping of the industry's policy of development, for one thing, and fairly quick results would flow from a simple change in the present policy that is followed in developing fields as quickly as they are discovered.

NEW fields, under the present forms of lease contracts, are certain to be exploited once discovered. The operator is obligated to perform certain acts, among them drilling offsetting wells to counteract the drainage influence of wells that may be drilled on the adjoining tract. Of recent years the development of newly found fields has proceeded at an ever accelerating pace, the tendency finding its fullest expression in the drilling of the Seminole district. The operators have moaned and wrung their hands, but they have gone on crying for more speed and increasing the scope of their operations.

The reason for drilling many of the Seminole wells was the insistence, actual or feared, of the royalty owners where leases were presently to expire. The reason for drilling hundreds of others in the frenzied campaign was the fear of drainage by other wells that were being rushed down for the same reason.

In consequence there has been spent in the Seminole district in drilling producing wells, dry holes and holes that were lost before they reached the sand, around 90 million dollars and with equipment for producing them by air gas lift, the figure is boosted to 100 million or better. This does not include the millions that were spent for acreage, tankage and operating expenses.

Could this expenditure, which brought the industry nothing but a depression, have been reduced? Probably—almost certainly, had a different operating policy been established early enough. That, however, is water under the bridge. The next step is to determine whether there is any plan of merit that will operate to flatten the extreme peaks of production and to enable the oil company to face the future with greater assurance that it will function evenly and with reasonable reward in the shape of profits. The chief consideration in this should be reduction of costs.

IN MAKING the suggestions that follow, no claim is made to originality. Insofar as it can be called a plan, it is merely a logical modification of

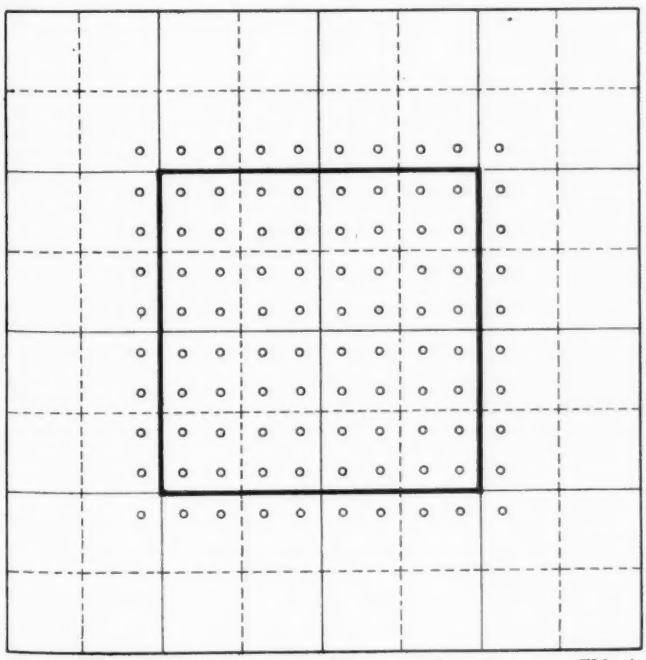

Figure 1—Plan of 640-acre tract with one well to 10 acres. This is the pattern developed in Burbank and used in most fields found since that time.

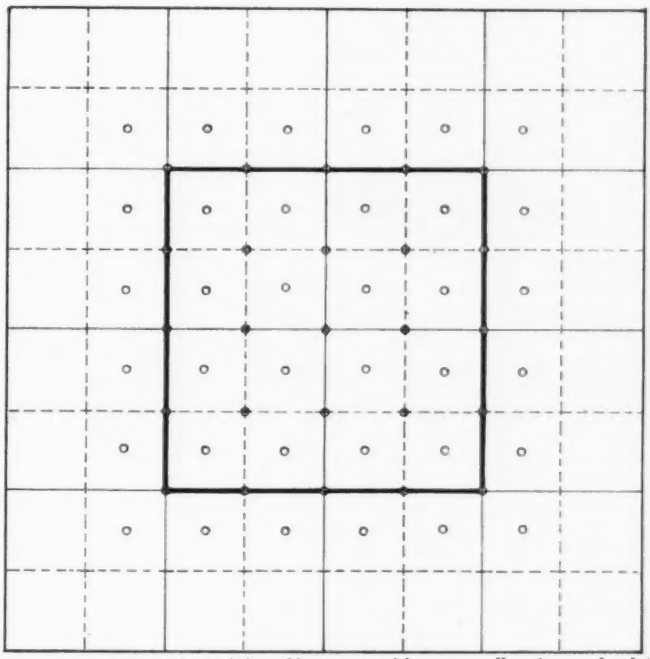

Figure 2—Plan of draining 20 acres with one well. Area of plat represents 640 acres.

existing practices, within the scope of the operator's rights under his lease contract and requiring no legislative enactments to give it force.

It has the merit of being capable of execution by simple revision of the present practice of well spacing and the further merit of leading to a vast reduction of development costs, which in itself contributes to profitable enterprise.

Taking Seminole as the starting point, since it is the district of chief importance today, the drilling program is found to be one well to 10 acres. That is uniformly 16 wells to the quarter section and the rule has been generally observed. Such spacing is based upon nothing but custom and the custom is fairly new. It was first put into practice, as a policy applying to an entire field, in Burbank. Prior to that spacing had been of several varieties. For years it was fairly general practice in the Mid-Continent to drill 25 wells to the quarter section, or one well to 6.4 acres.

In the closely drilled parts of the Glenn pool, less than 5 acres was the area of drainage for each well. They were of average depth of 1,500 feet and averaged in cost about $6,500. In the Cushing field the tendency was to get them a little farther apart, drilling in the richest parts of the field 20 wells to the 160 acres, or a well to 8 acres. Average depth of the wells to the Bartlesville sand in this pool was 2,600 feet and the cost was $20,000. In Burbank, with its uniform spacing of 16 wells to the 160 acres, the average depth is 2,800 feet and the cost around $40,000.

IT WAS time, when Seminole came in, to revise the well spacing program further. With wells costing around $80,000 for drilling and pumping equipment—but not including air lift equipment—and averaging 4,200 feet in depth, the operating burden would have been much lightened and the rate of production retarded by increasing the interval between wells. Adoption of a different program of well spacing might have been possible had it been taken up early, while the effort to effect a shut-down of some kind was a failure, although countless meetings were held on the subject.

Seminole acreage is held in small tracts in contrast to Burbank where the practice of the Osage Indian agency is to sell oil leases in 160-acre tracts. More difficulty would have been encountered in Seminole, therefore, but joint development arrangements between operators could have taken care of many of the troublesome spots.

THERE is no definite rule that applies to the spacing of wells. Many factors are involved, such as gravity of oil, gas pressure, water pressure, porosity of sand and diameter of well. These are all important in determining the interval between wells, but there are several economic considerations of equal or greater weight. These are rate of production, final yield, condition of oil market, prospective as well as present, cost of land, cost of operations and development cost.

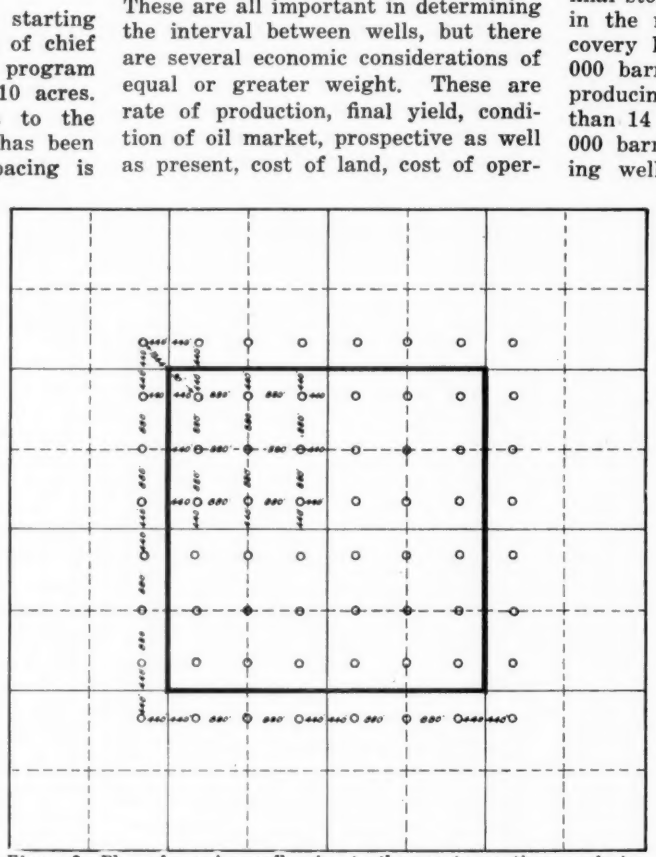

Figure 3—Plan of spacing wells nine to the quarter section, or draining 17.7 acres with one well.

The latter factor, in view of the already developed and partly proven reserves, is of almost dominating importance at this time. In other words, a development policy of close well spacing designed to get out the final possible barrel of oil in a short time would be an unwise policy, for it would aid in further depressing a market that is already uneconomic and would accomplish the liquidation of assets in the form of reserves at a figure below cost.

Hence, at this time, the aim of the operating company should be at the reduction of costs and particularly of development costs. That such reduction, accomplished by the drilling of fewer wells through the policy of spacing them farther apart would also retard production is important. It is less tangible to the operator, however, than the reduction of drilling costs which such policy would effect.

The drilling of one well to each 10 acres is not a rule fixed and inviolate, although the modern development has clung to it as though it were capable of scientific proof. We have seen the change since early day development of shallow territory where wells drained five acres or less. Yet the same rule is followed in Seminole and other deep territory as in Burbank where the wells cost half as much to drill.

It is idle to attempt comparison at this time between acreage recoveries in Burbank and in Seminole. Their final story is yet to be told. Burbank, in the nearly seven years since discovery has produced around 140,000,000 barrels and at present has 2,005 producing wells. Seminole, in less than 14 months, has produced 95,725,000 barrels, and now has 725 producing wells. The figures are cited to show that by following the same rule Seminole produced five-sevenths the oil that Burbank did in one-sixth the time.

The areas are chiefly comparable, however, on costs. And, since there will be many more pools that produce from the Wilcox sand and the future Mid-Continent developing promises to be largely of deep drilling character, a revision of program or well spacing is of immediate concern. The underground conditions are favorable to wider spacing. Wilcox sand pools are on closed geological structure and the pressure of the bottom and edge water probably are as influential in the movement of oil as is the gas pressure. In effect, there is a water drive which results in an effective recovery of oil from widely spaced wells, although not as quickly as where wells are drilled close together.

ILLUSTRATIVE of the variation possible from the present practice, three maps are published herewith. Fig. 1 shows the appearance of the typical well-to-10-acres development, where distances between wells are 660 feet direct and 933.4 feet diagonally. Under Seminole drilling practice, cost totals $5,120,000 per section, at $80,000 cost for drilling each well and equipping to pump, but not including cost of air lift equipment.

Fig. 2 shows how wells might be spaced to make the drainage area per well equal 20 acres. Direct distance between wells would be 1,320 feet and the diagonal distance would be 933.4 feet. The drilling cost would be half that of drilling one well to 10 acres. By disregarding those wells which are shown in the sub-division corners, the spacing would be one well to 40 acres, with wells still 1,320 feet apart but with the diagonal distance 1,866.8 feet. On the well to

40 acres plan, development cost per section would be $1,280,000.

FIG. 3 illustrates still another spacing program with nine wells to the quarter section, each well draining 17.7 acres. Wells would be 880 feet apart, direct line, and 1,244.50 feet diagonally. In Seminole type territory, with wells costing $80,000 each, development cost per section would total $2,880,000 per section.

As to practicability of spacing programs of the types suggested: It is pretty difficult to get away from the well to 10 acre plan where there is a considerable amount of the leases in a given pool in 10 and 20 acre tracts, unless there is pooling of both leasehold and royalty interests. An occasional 10 acre piece could be acquired by purchase by the operator or operators whose agreed upon spacing program was threatened by such outstanding acreage. There is one instance in the Mid-Continent where three companies joined in buying, in fee, a 10-acre strip upon which one or more wells would have been drilled, compelling useless offsets. After buying it the new owners declared it neutral territory and it will not be drilled without the consent of all.

Where all the leases are in 40-acre tracts or multiples thereof, the program of a well to 40 acres is applicable. Assume that such a course of drilling were subscribed to by all the operators. After a period of perhaps several years it might be thought advisable to do additional drilling to recover oil that might be trapped between the wells, if sand conditions and the convolutions of the reservoir rock made it appear that some territory was yet undrained by this wide spacing. By drilling "five-spot" wells in the diagonal centers between wells, there would then be a well to 20 acres. Some of the new wells would be drilled on common corners, draining the territory of two or more operators and would necessarily be drilled at joint expense. The tendency toward joint drilling is pronounced enough that this feature can be classed as practicable. So far as the royalty interests are concerned, there would have to be a communizing of them on these jointly owned "five-spot" wells. That could easily be done. The royalty owners would merely have the choice of getting additional revenue from the new well or holding out and getting no new well.

WHERE all leases are held on regularly shaped 160 acre tracts, the program of a well to 17.7 acres is simple of application. Such is the case in all of what once was the Territory of Oklahoma. Lands in the old Indian Territory are cut into so many fractional pieces of a quarter section that, unless the company blocks its acreage systematically at the outset, difficulty will be encountered in revising well spacing program. The alternative course is to effect arrangements with neighbors, joining with some on the expense of drilling and buying out very small tracts, particularly those owned by one lessor but split up as leaseholds.

THERE is no escaping the fact that the Seminole development has been one of the most costly in the history of the industry. There has been from the start a frenzied race to reach the sand in every well except the remote wildcats. The urgency would have been removed had the interval between wells been considerably increased as the drainage of the leaseholds would have been retarded to the point where a few weeks difference in completion time would not have been damaging. Besides, the vast outlay of capital would have been reduced in important proportions to each company, the development would have been orderly and the rate of extraction would have been more in accordance with public requirements. The huge investment for tankage that has been made would likewise have been reduced to a reasonable figure.

Seminole's example contains a lesson. If the industry begins now to consider reduction of development costs on the next pool, planning to spend its money guardedly and still comply with its contracts with the landowners, probably there will be no necessity for going through these futile conferences to agree on stopping the drill.

Radiant Oil Leases Its Stations

LIMA, O., Sept. 9.—Its 96 service stations in Ohio will be leased to individual operators by the Radiant Oil Co. immediately, according to E. E. Bessire, vice president and general manager.

The Radiant company will furnish gasoline and motor oils to these stations 14 of which are in Lima, the headquarters of the company. More property adjoining some of the stations is being acquired by the company to be used as camping space for tourists. About $25,000 are being invested in this additional feature, it is reported.

GLASGOW, Mont.—G. E. Crawford, of Shelby, Mont., has been placed in charge of the Glasgow plant of the H. Earl Clack Co., Havre, Mont. A new truck has been added to delivery equipment, which makes two trucks making deliveries from this plant.

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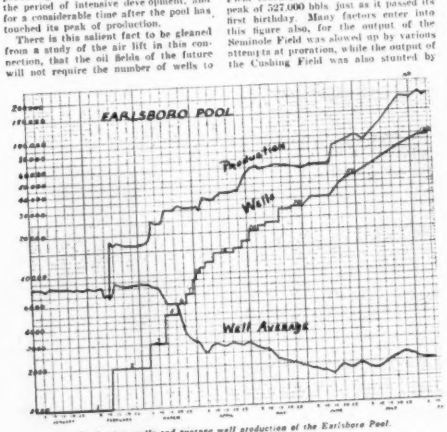
Air-Gas Lift Permits Big Well Average

Fewer Wells Needed With That Method of Production To Build Up Large Output Quickly. Will Affect Many Areas

By J. L. Dwyer

There are dozens of different phases to be considered regarding the effect which air-gas lift equipment will exert upon the major oil fields of the future, and probably one of the most important, and one which will have the greatest bearing upon the stability of the future crude markets, is the unusually large average production per well which is maintained not only during the time when a few wells are producing in a new pool, but all through the period of intensive development, and for a considerable time after the pool has touched its peak of production.

There is this salient fact to be gleaned from a study of the air lift in this connection, that the oil fields of the future will not require the number of wells to



Production, wells and average well production of the Earlsboro Pool.

maintain a production which places them in the category of major pools, for the lift will be capable of sustaining the output of the wells after they are drilled in.

In the major pools of the past, the average production per well has registered a sharp drop soon after the first group of wells have been completed. The Tonkawa Wilcox sand pool attained its peak when 21 wells were drilled in. The Wewoka Wilcox sand operation near the city of Wewoka in Seminole County touched its highest had been completed these fields had sou its use was far from was deep field especi plied long after the pided.

Although the We from being a major in this connection h some extent a prod what similar to th area, and in fact its places it in the san no e.

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greater quantities of crude on the market in a much shorter period of time than has been the experience in former fields.

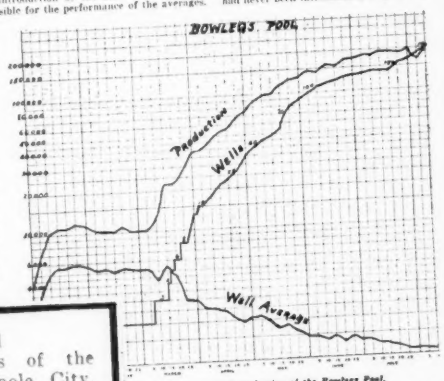
Some comparisons between fields of former times, and the Seminole area are interesting. The famous Cushing Field of Creek County was the closest in point of peak to Seminole. The Cushing Field attained a peak of 310,000 bbls., after it had been producing for 18 months. Due chiefly to the use of the lift, the Seminole Field touched what is thought to be its peak of 327,000 bbls just as it passed its first birthday. Many factors enter into this figure also, for the output of the Seminole Field was slowed up by various attempts at proration, while the output of the Cushing Field was also stunted by inadequate pipe line facilities, and unfavorable price conditions. Just what the Cushing Field would have done had it possessed full transportation facilities at a time when a good price for oil would have encouraged drilling is problematical, but since both fields have had the same unfavorable factors, it is not unreasonable to treat their peaks alike. The air lift in this case has speeded up the peak of the field by 50 per cent.

There was another difference between reasonably close. The average has approximated 400 bbls. per well in the early stages of the field, and as drilling continued this quantity has decreased to 200 bbls. per well.

These field were all opened by wells making from 2,000 to 5,000 bbls. respectively, and the average output per well declined after seven or eight wells were completed. The Texas Panhandle is an exception to this last statement, and owing to the far-flung borders of production, the head or pressure was little affected, and the average per well resisted the drop for a longer period than the other pools mentioned.

Considering the flush stage of any of the pools named, an average production per well of 300 bbls. may be considered a respectable figure, and if the pool maintained this average until the drilling campaign was over it was reckoned a good average.

Compare this figure with the average output per well of the Earlsboro or Bowlegs Pools, and the Greater Seminole average. The Earlsboro average per well was originally high, owing to the discovery well having an initial output of 8,900 bbls. The second and third wells to be completed in this pool also have good production, leaving the average still high. The effect of drainage upon the wells did not result in a drop of average production until the fourth well in the pool was completed, and from that time on the introduction of the air lift was responsible for the performance of the averages.



wells and average well production of the Bowlegs Pool.

tive of what may be expected from the operation of the lift in the future, because this pool owes its prominence to the lift exclusively. A very limited gas pressure causing a flowing life of very short duration for the Bowlegs wells, and the lift is applied to wells in this field within two weeks after they have penetrated the sand.

During the period when there were two wells at Bowlegs, the average followed the production remarkably. When the fifth well at Bowlegs was completed the decline started and the output per well dropped until March 25, at which time the decline per well was arrested by the installation of several air lift plants which steadied the average per well temporarily but could not at that period maintain it. On June 1, the pool was about six months old, and had 90 completed wells which showed an average of 1,500 bbls. per well, a very unusual figure for this number of wells at this age of a pool. On this same date, the Earlsboro Pool had approximately the same age and showed an average of 1,900 bbls. per well from 30 wells. The higher figure of the Earlsboro Pool was caused by the large natural flow which is general in the pool. The Bowlegs averages may be considered representative of the use of the air lift, and will very likely be employed in computing future operations of the lift.

Just what would have occurred in the Greater Seminole area if the air lift had never been introduced is very difficult

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Big Average Per Well

Considering all four pools of the Greater Seminole area, Seminole City, Searight, Bowlegs and Earlsboro, the average output per well since discovery to date has ranged from 1,400 to 615 bbls., and this figure, remembering the wide range of territory, the varying dates of discovery, and totally different sand conditions, is highly significant, and undoubtedly establishes a record for average well performance. It is due to the use of the air lift.

Burbank, Tonkawa shallow, the Texas Panhandle, Lyons-Quinn, and the Papoose and Cromwell Pools have all registered an average production per well which is

CLARK BROS., CO.
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Crude Output Gains 21% Over 1927 And Gasoline Demand 14%

Staff Special
CLEVELAND, Sept. 9

DOMESTIC demand for gasoline in the first seven months of 1927 totaled 166,125,000 barrels, compared with 145,951,000 barrels in the first seven months of 1926. This was an increase of 13.8 per cent this year. Domestic gasoline demand in July was the largest in the history of the industry and output also touched a new high record. Although gasoline exports slumped, gasoline stocks were lowered 4,699,000 barrels in July to 39,069,000 barrels at the end of the month. Gasoline stocks on July 31, 1926 were 38,315,000 barrels. Gasoline exports to July 31 were less than in the corresponding time last year.

Crude oil production again reached a new height, the Bureau of Mines statistics of July petroleum operations tending only to confirm what most every oil man knew. Seminole's production averaged 490,000 barrels daily compared with 386,000 barrels in June. This brought the average production in Oklahoma up to 866,500 barrels, a gain of 82,500 barrels in the daily average. Daily average production for the whole country was 2,526,900 barrels compared with 2,484,600 barrels average in June, a gain of 42,300 barrels in the daily average. There were notable gains in production in Wyoming outside of Salt Creek and in the Caddo field of Louisiana. California production fell 16,100 barrels daily average.

OTHER outstanding facts in the bureau's reports on July operations include:

1. Rise of 8,810,000 barrels in stocks of crude oil.

2. Fall of 879,000 barrels in stocks of refined oils.

3. Increase of 21,000 barrels in stocks of natural gasoline.

4. Decrease of 1,597,000 barrels in stocks of refinable California crude.

5. At July rate of demand stocks of all oils above ground July 31 were equivalent to 222.6 days' supply. Stocks July 31, 1926, were equivalent to 206.9 days' supply at the rate of demand then current.

6. Stocks of all oils have increased 51,321,000 barrels since Dec. 31, last, whereas stocks of both crude and refined oils decreased 20,355,000 barrels in the first seven months of 1926.

7. Kerosene stocks increased 471,000 barrels when both foreign and domestic demand fell.

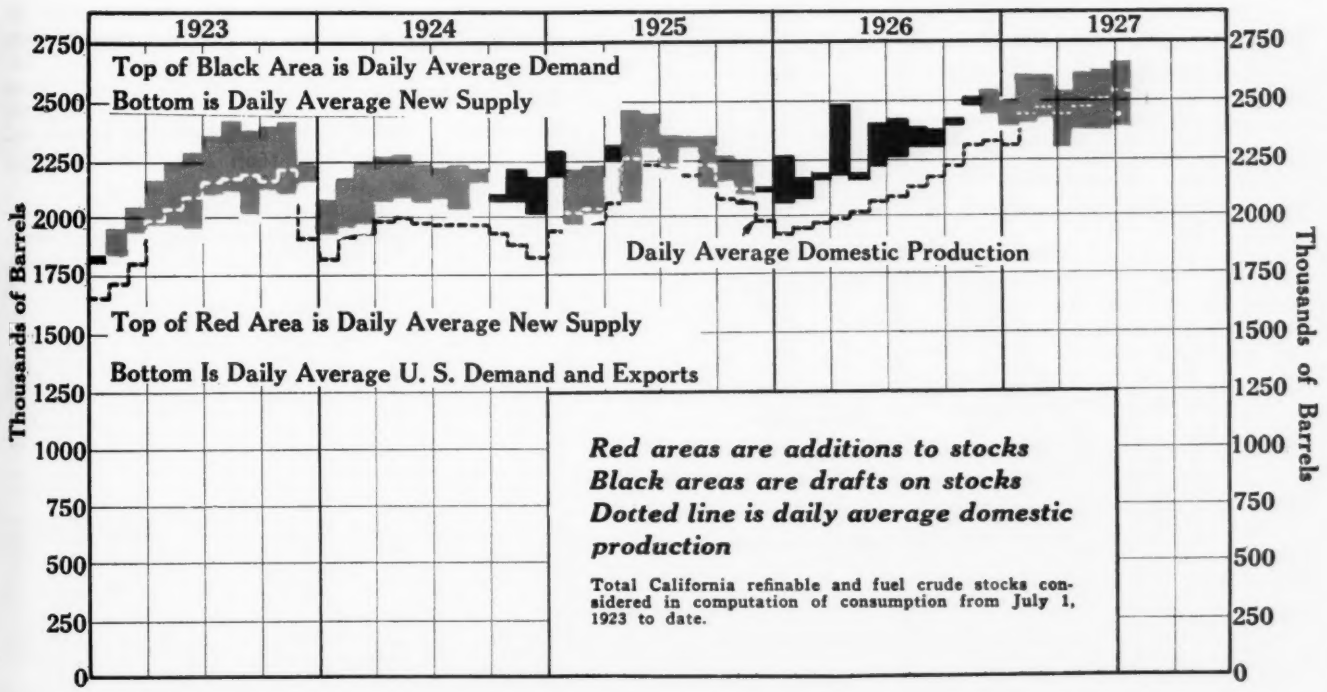
8. Lubricating oil stocks decreased 132,000 barrels, although a slackening in domestic demand exceeded an increase in exports. This was the third consecutive month in which there were drafts on lubricating oil stocks.

9. Wax stocks shrank 7,307,000 pounds to 191,501,000 pounds. July also was the third consecutive month in which wax stocks were drawn on.

10. Gas and fuel oil stocks each of California increased 2,300,000 barrels.

11. Increased charges of crude oil to stills; increase in use of natural gasoline, and decline in use of unfinished oils, probably largely cracking stock.

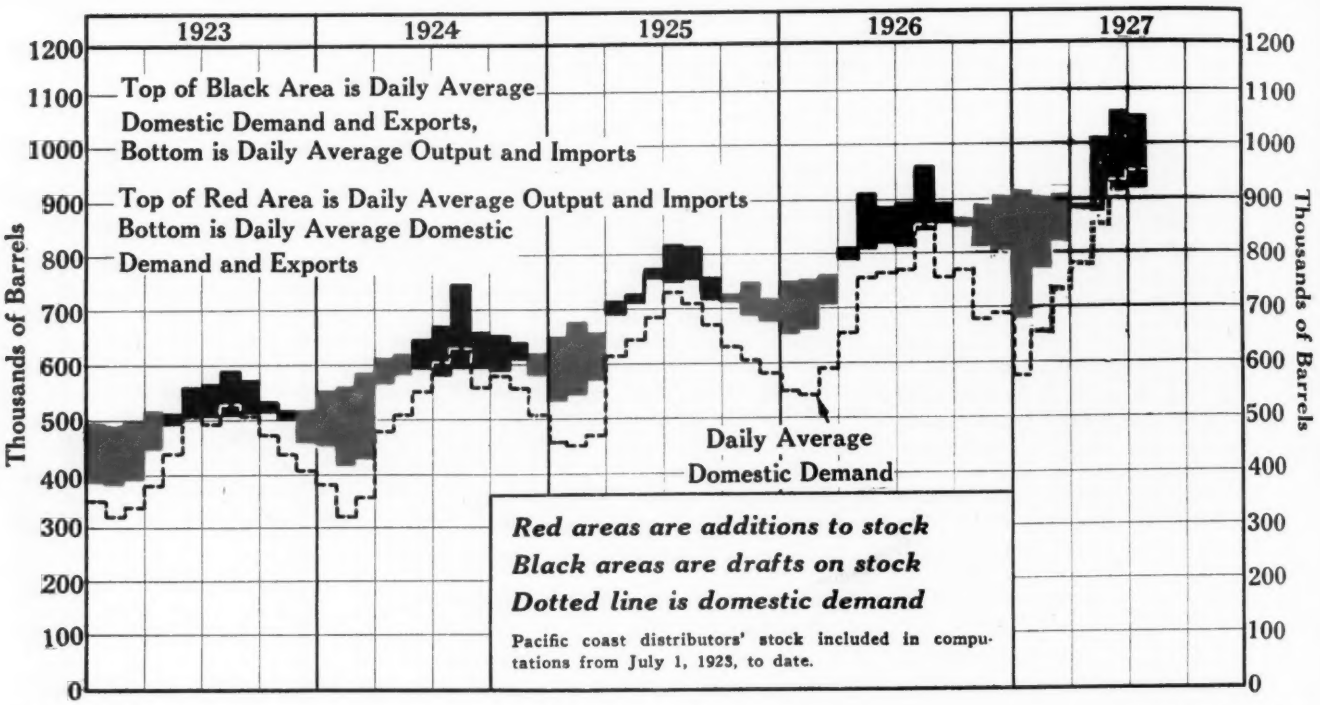
Crude Oil Production and Demand



July domestic production	2,526,900	Bbls. daily av.
July imports	150,800	Bbls. daily av.
Total new supply	2,677,700	Bbls. daily av.
July indicated demand east of California	1,721,700	Bbls. daily av.
July indicated California deliveries	636,700	Bbls. daily av.
July exports	35,100	Bbls. daily av.
Total indicated demand	2,393,500	Bbls. daily av.

Stock in pipe lines and at tank farms east of California, July 31, 1927	288,087,000	Bbls.
Stock at refineries east of California	36,545,000	Bbls.
Stocks of foreign crude not at refineries	298,000	Bbls.
California stocks 20° and lighter	25,301,000	Bbls.
California stocks heavier than 20°	91,695,000	Bbls.
Total stocks July 31, 1927	441,926,000	Bbls.
Increase in stocks in July	8,810,000	Bbls.
Stocks July 31, 1926	400,312,000	Bbls.

Gasoline Production and Consumption



July domestic output	907,000 Bbls. daily av.	July exports	104,000 Bbls. daily av.
July imports	6,000 Bbls. daily av.		
Total new supply	913,000 Bbls. daily av.	Total indicated demand	1,065,000 Bbls. daily av.
July domestic shipments	961,000 Bbls. daily av.	Stocks July 31, 1927	39,069,000 Bbls.
		Decrease in stocks in July	4,699,000 Bbls.
		Stocks July 31, 1926	38,289,000 Bbls.

THE excess of supply of all oils over demand in July averaged 257,100 barrels daily. This was an increase of 121,000 barrels over the June average and 343,000 barrels more than in July, 1926, when the new supply of oil was 86,000 barrels daily average less than demand in that month. The total excess of new supply of all oils over demand was 7,952,000 barrels.

With the exception of Oklahoma and Texas crude oil production in July was considerably less than in July, 1926, in most states. A few states made small gains and in several there was little difference between production in the two months. In Oklahoma the daily average recovery had increased 390,700 barrels in a year. In Texas the average last July was 122,400 barrels more than in July, 1926.

Of the July production 2,221,500 barrels was of 24° A.P.I. gravity or lighter and 305,400 heavier than 24°. In July, 1926, 1,712,000 barrels were light oil and 381,000 barrels heavy oil. The gain in volume of light oil is due mainly to Seminole and the fall in volume of heavy oil largely to the fall in Smackover production.

In the first seven months of this year production for all states totaled 516,389,000 barrels compared with 425,903,000 barrels in the corresponding time of 1926. This was a gain of 90,522,000 barrels or 21.2 per cent. Imports fell from 36,810,000 to 30,443,000 barrels, a decline of 6,367,000 barrels or 17.2 per cent. Total new supply of crude oil was 84,119,000 barrels more than in the first seven months of 1926, or 18.1 per cent. Production was larger this year than last in all regions except the central states and Rocky Mountain. The Mid-Continent, of course, was the leader.

Stocks of crude oil increased less than 1,000,000 barrels at refineries east of California in July. Stocks held by refiners July 31 were almost on a level with their supply of raw material held July 31, 1926. Pipe line and tank farm stocks east of California increased 8,456,000 barrels in July. Crude stocks in California fell 418,000 barrels due to draft on refinable crude.

Gasoline production was stepped up 2.24 per cent in July. Largest increase in production was in the Oklahoma-Kansas district. The largest curtailment in output was in the Rocky Mountain district but in that district output averaged less than 1,000 barrels a day less than in June.

Shipments of gasoline in July averaged 0.96 per cent more than in June. Shipments fell off in the East Coast,

Petroleum Supply and Demand — Barrels

	July, 1927	*June, 1927	May, 1927	July, 1926
Domestic Crude production: Light	68,866,000	65,335,000	66,901,000	53,501,000
Heavy	9,467,000	9,203,000	9,374,000	11,667,000
Imports of crude oil	4,675,000	4,019,000	4,557,000	5,185,000
Imports of refined oil	1,202,000	1,448,000	1,329,000	1,992,000
Natural Gasoline	3,119,000	3,093,000	3,219,000	2,629,000
Benzol	214,000	210,000	221,000	179,000
Total new supply all oils	87,543,000	83,308,000	85,601,000	75,153,000
Total stocks end preceding month	563,466,000	559,386,000	552,595,000	527,530,000
Total supply of all oils	651,009,000	642,694,000	638,196,000	602,683,000
Exports of crude oil	1,089,000	1,410,000	1,390,000	1,726,000
Exports of refined oil	10,057,000	11,307,000	11,863,000	8,762,000
Domestic demand, crude and refined	68,445,000	66,511,000	65,557,000	67,332,000
Total Demand	79,591,000	79,228,000	78,810,000	77,820,000
Total stocks of all oils end month	571,418,000	563,466,000	559,386,000	524,506,000
Increase in stocks	7,952,000	4,071,000	6,791,000	†3,024,000
Daily average new supply	2,824,000	2,777,000	2,761,000	2,424,000
Daily average demand	2,567,000	2,641,000	2,542,00	2,510,000
Daily average excess of supply	257,000	136,000	219,000	††86,000
Crude stocks:				
East of California: Light	277,772,000	268,217,000	259,469,000	221,535,000
Heavy	47,158,000	47,485,000	47,547,000	57,137,000
In California: Light	25,301,000	26,898,000	27,143,000	33,548,000
Heavy	91,695,000	90,516,000	90,289,000	88,092,000
Total stocks of crude	441,926,000	433,116,000	424,448,000	400,312,000
Total stocks of refined	128,500,000	129,379,000	134,012,000	123,563,000
Stocks of natural gasoline	992,000	971,000	926,000	631,000

*Revised †Decrease ††Daily average deficiency

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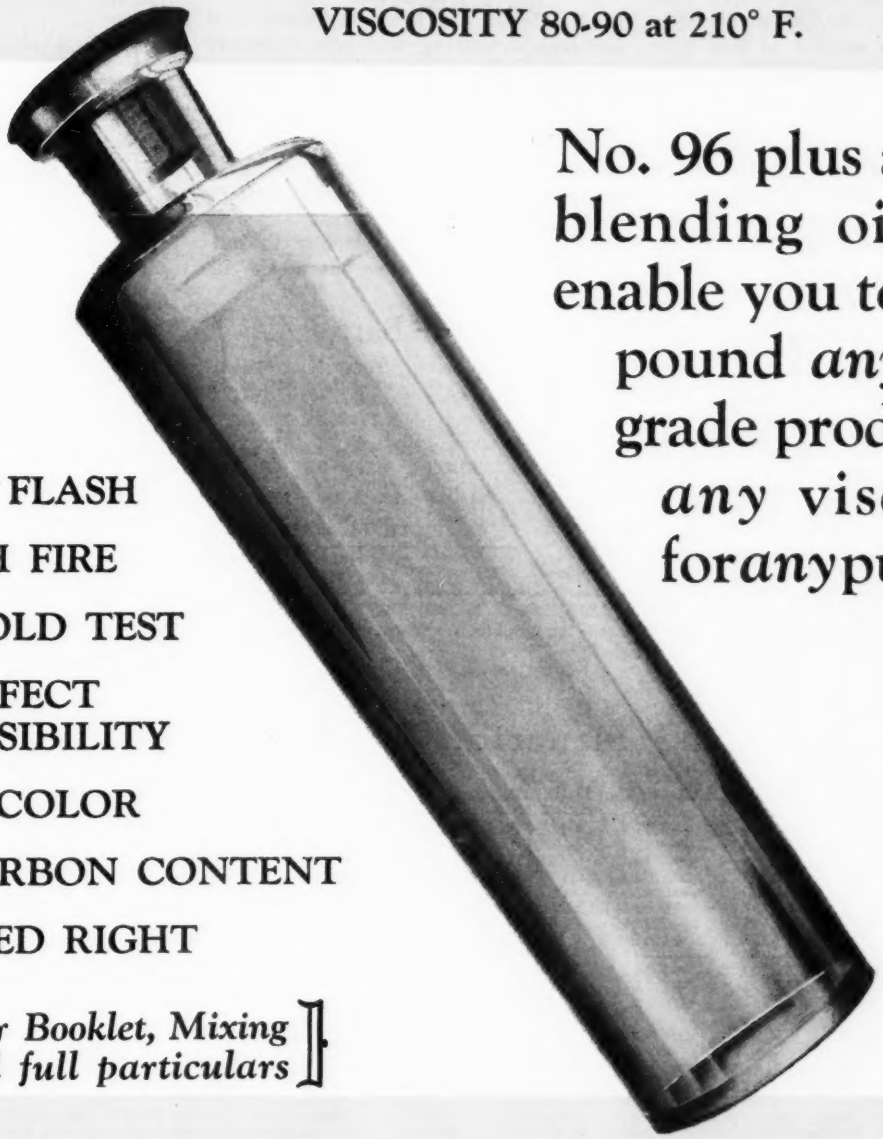

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SUN OIL COMPANY
PHILADELPHIA

Appalachian, Indiana-Illinois, and Texas districts. Stocks were lowered in every district, the largest draft having been at East Coast plants, 1,740,000 barrels.

Both domestic output and demand were the largest in the industry's existence but both imports and exports were low. Imports were the least of imports in any month this year or last. Exports were the least since March when the total shipments abroad were only 4,000 barrels less than in July. Only two months of 1926 had a smaller volume of foreign shipments than July.

Although domestic demand for gasoline to July 31 has increased 13.8 per cent over domestic demand in the first seven months of 1926, export demand has fallen 60,000 barrels or 0.2 per cent to a total of 25,873,000 barrels. Imports were 130,000 barrels more in the first seven months of this year than in the corresponding time last year.

It is doubtful that Bureau of Mines statistics for August will show gasoline to as good an advantage as the present figures. This is because of the cool weather through the Middle West and the heavy rainfall on the Atlantic coast each week-end in August. Belief has been expressed that automobile touring was less extensive this year than last but one company in New York state which operates a tourist camp, restaurant and filling stations on one of the main east-west highways reported touring at least equalled and possibly exceeded touring last year.

There was a small decline in output of natural gasoline but stocks increased. The largest accumulation of natural gasoline was in Texas and the next largest gain was in the Oklahoma-Kansas district.

Kerosene output was increased 0.73 per cent over June daily average output. Daily average shipments were 9.87 per cent less than June average shipments. Stocks increased more than 500,000 barrels. Stocks were re-

Crude Production — Barrels

(Daily Averages)

States	July 1927	June 1927	July 1926
Arkansas	107,200	110,900	164,548
California	623,200	639,300	604,619
Colorado	7,800	7,200	9,548
Illinois	18,500	20,000	21,968
Indiana	2,300	2,400	2,225
Kansas	108,200	114,400	120,484
Kentucky	19,000	18,600	17,748
Louisiana	59,500	55,100	67,355
Michigan	1,200	1,300	161
Montana	15,000	15,800	29,000
New Mexico	2,800	3,000	4,291
New York	5,900	6,300	5,613
Ohio	20,200	22,200	20,549
Oklahoma	866,500	784,000	475,768
Pennsylvania	25,700	27,700	25,290
Tennessee	200	100	90
Texas	564,400	580,300	441,839
West Virginia	15,800	17,000	16,807
Wyoming	63,500	59,000	65,419
Total U. S.	2,526,900	2,484,600	2,093,322

CLASSIFICATION BY GRAVITY

24° A. P. I. and lighter	2,221,500	2,177,800	1,712,000
Heavier than 24°	305,400	306,800	381,322

Crude Oil Production by Fields — Barrels

Fields	July Daily Average 1927	June Daily Average 1927	July Daily Average 1926	Total Jan.-July 1927	*Total Jan.-July 1926
Appalachian	82,100	86,600	80,548	17,578,000	16,349,000
Lima-Indiana	5,000	5,700	5,968	1,109,000	1,219,000
Michigan	1,200	1,300	161	253,000	18,000
Ill., S.W. Indiana	20,500	22,000	23,774	4,550,000	4,917,000
Mid-Continent	1,575,000	1,505,900	1,155,607	309,162,000	231,234,000
Gulf Coast	130,800	138,800	114,387	29,890,000	20,134,000
Rocky Mountain	89,100	85,000	108,258	18,343,000	23,146,000
California	623,200	639,300	604,619	135,504,000	128,886,000
Total U. S.	2,526,900	2,484,600	2,093,322	516,389,000	†425,903,000
Imports	150,800	134,000	167,258	30,443,000	36,810,000
Total new supply crude	2,677,700	2,618,600	2,260,580	546,832,000	462,713,000

*Final figures; total includes approximately 2,000,000 barrels consumed on leases, etc., not included in 1927 figures.
†Includes Alaska and Utah

Stocks of Crude Oil

(Domestic unless otherwise specified. Amounts in Thousands of Barrels.)

AT REFINERIES

Districts	July 1927	June 1927	July 1926
East Coast:			
Domestic	8,999	8,720	8,582
Foreign	2,671	2,909	3,092
Appalachian	1,785	1,668	1,722
Indiana, Illinois, etc.	2,561	2,507	1,881
Oklahoma, Kansas, etc.	4,428	4,413	3,081
Texas: Inland	1,450	1,304	1,133
Texas Gulf Coast:			
Domestic	6,657	6,961	6,627
Foreign	226	242	416
Ark. and inland Louisiana	454	431	572
Louisiana Gulf Coast:			
Domestic	4,559	4,037	6,664
Foreign	1,373	1,282	1,089
Rocky Mountain	1,382	1,293	1,500
U.S. East of Calif.	36,545	35,767	36,359

AT TANK FARMS, IN PIPE LINES AND ELSEWHERE THAN REFINERIES

Appalachian	6,855	6,733	6,984
Kentucky	1,198	1,343	1,668
Lima-Indiana	900	820	771
Ill.-S.W. Indiana	12,184	11,712	11,731
Okla.-Kan., Texas except Coastal	194,085	185,376	135,445
N. La.-Ark.	27,792	28,191	38,815
Gulf Coast	17,696	18,257	16,003
Rocky Mountain	27,377	27,199	30,527
East of Calif. pipe line, tank farm stocks	288,087	279,631	241,944
Foreign Crude:			
Atlantic Ports	42	67	70
Gulf Ports	256	237	299
Total refinery, pipe line, and tank farm stocks east of Calif.	324,930	315,702	278,672
California:			
20° and lighter	25,301	26,898	33,548
Heavier than 20°	91,695	90,516	88,092
GRAND TOTAL	441,926	433,116	400,312

CLASSIFICATION BY GRAVITY
(Elsewhere than refineries east of California)

24° and lighter	277,772	268,217	221,535
Heavier than 24°	47,158	47,485	57,137

Gasoline Situation by Districts—Barrels

Districts	July Daily Avg. Output	June Daily Avg. Output	July Change %	July Daily Avg. Shipments	June Daily Avg. Shipments	July Change %	Stocks July 31, 1927	Stocks June 30 1927	Stocks July 31, 1926	Districts
East Coast	126,290	126,733	—0.35	182,419	189,333	—3.65	6,615,000	8,355,000	8,232,000	East Coast
Appalachian	32,161	33,300	—3.42	35,355	36,900	—4.19	833,000	932,000	775,000	Appalachian
Ind., Ill., etc.	129,323	123,867	+4.40	135,613	138,367	—1.99	4,664,000	4,859,000	4,549,000	Ind., Ill., etc.
Okla. Kans., etc	158,484	149,733	+5.84	174,806	170,667	+2.43	3,158,000	3,664,000	2,927,000	Okla., Kans.,etc
Texas	191,355	191,400	—0.28	202,935	213,033	—4.74	5,829,000	6,188,000	4,024,000	Texas
La. and Ark.	67,419	61,467	+9.68	86,290	84,500	+2.12	2,162,000	2,747,000	3,504,000	La., and Ark.
Rocky Mount.	38,581	39,433	—2.16	55,516	51,433	+7.94	3,970,000	4,495,000	4,215,000	Rocky Mount.
California	163,419	160,767	+1.65	185,677	164,333	+12.99	11,838,000	12,528,000	10,088,000	California
U.S. Total	907,032	887,200	+2.24	1,058,611	1,048,566	+0.96	39,069,000	43,768,000	38,314,000	U. S. Total
Tex. Gulf Coast	149,452	147,633	+1.23	157,677	158,467	—0.50	5,107,000	5,362,000	3,644,000	Tex. Gulf Coast
La. Gulf Coast	53,484	48,367	+10.58	72,290	71,200	+1.53	2,050,000	2,633,000	3,450,000	La. Gulf Coast

Natural Gasoline and Motor Blends—Barrels

Districts	Daily Avg. Production July (Net)	Daily Avg. Production June (Net)	Stocks End of July	Stocks End of June	Motor Fuel Blends Made in July	Motor Fuel Blends Made in June	Stocks of Blends End of July	Stocks of Blends End of June	Districts
Appalachian	4,147	4,603	72,548	92,452	8,429	8,024	6,738	7,310	Appalachian
Ind. Ill., etc.	845	873	11,929	11,952	643	1,095	381	381	Ind., Ill., etc.
Okla., Kans., etc.	37,020	37,460	476,428	453,357	153,667	137,810	16,333	26,905	Oak., Kan., etc.
Texas	19,585	20,159	362,929	330,405	30,786	30,595	5,738	1,429	Texas
Louisiana and Ark.	5,376	5,397	23,905	40,524	11,595	12,286	4,024	4,286	La., and Ark.
Rocky Mountain	3,149	3,333	12,881	13,167	2,738	2,762	3,143	3,357	Rocky Mount.
Total east of Calif.	70,122	71,825	960,620	941,857	207,858	192,572	36,357	43,668	Total east of Cal.
California	30,492	31,270	31,524	28,786	.....	.....	24	23	California
U. S. Total	100,614	103,095	992,144	970,643	.....	.....	36,381	43,691	U. S. Total

Kerosene Situation by Districts—Barrels

Districts	July Daily Avg. Output	June Daily Avg. Output	July Change %	July Daily Avg. Shipments	June Daily Avg. Shipments	July Change %	Stocks July 31, 1927	Stocks June 30, 1927	Stocks July 31, 1926	Districts
East Coast...	27,935	26,433	+5.68	21,484	18,033	+19.14	1,789,000	1,589,000	1,772,000	...East Coast
Appalachian..	10,194	11,567	—11.87	9,032	11,100	—18.63	336, 000	300,000	240,000	...Appalachian
Ind., Ill., etc..	17,097	15,467	+10.54	10,710	14,567	—26.48	919,000	721,000	682,000	..Ind., Ill., etc.
Okla., Kans., etc	24,871	23,600	+5.39	21,355	22,800	—6.34	642,000	533,000	367,000	Okla., Kans.,etc
Texas.....	33,065	30,667	+7.82	31,677	34,467	—8.09	1,710,000	1,667,000	1,760,000	..... Texas
La. and Ark..	14,065	16,100	—12.64	17,774	22,600	—21.35	1,396,000	1,511,000	1,513,000	...La., and Ark
Rocky Mount.	5,452	5,300	+2.87	5,323	5,533	—3.80	322,000	318,000	292,000	.Rocky Mount.
California....	11,968	14,467	—17.27	12,097	14,533	—16.76	1,924,000	1,928,000	1,812,000	.....California
U.S. Total..	144,647	143,601	+0.73	129,452	143,633	—9.87	9,038,000	8,567,000	8,438,000	....U. S. Total
Tex. Gulf Coast	27,194	24,967	+8.92	24,355	29,333	—16.97	1,332,000	1,244,000	1,467,000	Tex. Gulf Coast
La. Gulf Coast	12,129	13,833	—12.32	15,806	20,533	—23.02	1,357,000	1,471,000	1,480,000	.La. Gulf Coast

Lubricants Situation by Districts—Barrels

Districts	July Daily Avg. Output	June Daily Avg. Output	July Change %	July Daily Avg. Shipments	June Daily Avg. Shipments	July Change %	Stocks July 31, 1927	Stocks June 30, 1927	Stocks July 1926	Districts
EastCoast...	26,839	25,667	+4.57	26,516	34,967	—24.17	2,553,000	2,543,000	2,514,000	....East Coast
Appalachian..	11,548	12,200	—5.34	12,645	12,533	+ 0.89	952,000	986,000	912,000	Appalachian.
Ind., Ill., etc..	10,194	8,467	+20.40	10,323	8,533	+20.98	675,000	679,000	713,000	..Ind., Ill., etc.
Okla., Kans., etc.	6,323	6,833	—7.46	7,355	7,600	—3.22	413,000	445,000	400,000	Okla., Kans.,etc
Texas.....	21,548	22,533	—4.37	25,032	22,467	+11.42	1,796,000	1,904,000	1,669,000	..... Texas
La. and Ark..	1,774	1,900	—6.63	1,839	2,133	—13.78	108,000	110,000	94,000	..La., and Ark.
Rocky Mount.	1,613	1,600	+0.81	1,774	1,567	+13.21	122,000	127,000	176,000	.Rocky Mount.
California....	6,355	6,500	—2.23	4,968	8,667	—42.68	877,000	834,000	849,000	.....California
U.S. Total....	86,194	85,700	+0.58	90,452	98,467	—8.14	7,496,000	7,628,000	7,327,000	....U. S. Total
Texas Gulf Coast	20,419	21,367	—4.44	24,000	21,533	+11.46	1,753,000	1,864,000	1,633,000	Tex. Gulf Coast
La. Gulf Coast..	1,774	1,900	—6.63	1,839	2,133	—13.78	108,000	110,000	94,000	.La. Gulf Coast

Gas and Fuel Oil—Situation by Districts—Barrels

Districts	July Daily Avg. Output	June Daily Avg. Output	July Change %	July Daily Avg. Shipments	June Daily Avg. Shipments	July Change %	Stocks July 31, 1927	Stocks June 30, 1927	Stocks July 31, 1926	Districts
East Coast...	201,032	191,500	+4.98	153,065	172,700	—11.37	8,917,000	7,430,000	6,402,000	...East Coast
Appalachian..	17,839	19,633	—9.14	16,871	19,300	—12.59	896,000	866,000	660,000	...Appalachian
Ind., Ill., etc..	63,000	61,000	+3.28	54,226	55,500	—2.30	1,545,000	1,273,000	1,458,000	..Ind., Ill., etc.
Okla., Kans., etc	102,097	92,067	+10.89	83,581	88,900	—5.98	5,241,000	4,667,000	4,895,000	Okla., Kans.,etc
Texas.....	194,194	196,900	—1.37	188,387	204,467	—7.86	8,372,000	8,192,000	7,936,000	..... Texas
La. and Ark...	76,548	80,633	—5.07	86,516	84,033	+2.95	3,272,000	3,581,000	2,957,000	...La., and Ark
Rocky Mount.	19,032	19,733	—3.55	16,903	18,867	—10.41	647,000	581,000	1,388,000	.Rocky Mount.
California....	413,129	394,900	+4.62	.....	.....	.....	.....	.....	.....	.....California
U. S. Total...	1,086,871	1,056,366	+2.89	1,012,677	1,038,667	—2.50	28,890,000	26,590,000	25,696,000	....U. S. Total
Texas Gulf Coast	145,935	147,100	—0.79	144,839	158,767	—8.77	6,790,000	6,756,000	6,808,000	Tex. Gulf Coast
La. Gulf Coast	40,645	42,133	—3.53	46,710	46,133	+1.25	2,672,000	2,860,000	2,229,000	.La. Gulf Coast

Coke, Asphalt, Miscellaneous Products

	Coke Output (Tons)	Coke Stocks (Tons)	Asphalt Output (Tons)	Asphalt Stocks (Tons)	Miscel. Products Output (Bbls.)	Miscel. Products Stocks (Bbls.)	Unfin. Oil Output (Bbls.)	Unfin. Oil Stocks (Bbls.)	Losses (Bbls.)	
January, 1926....	73,701	230,566	162,383	174 564	491,652	1,063,619	2,097,000	37,880,000	1,995,000	.....January, 1926
February.....	64,105	210,247	152,468	182,063	481,428	1,073,238	2,340,500	28,808,000	1,767,000	.....February
March.....	80,689	219,820	210,596	195,052	597,810	1,217,119	2,195,928	39,098,000	2,059,000	.....March
April.....	76,031	216,163	198,598	239,953	572,381	1,138,095	2,481,952	38,785,000	1,982,000	.....April
May.....	79,982	234,025	248,390	229,819	779,310	1,210,428	2,756,024	38,681,000	2,270.000	.....May
June.....	81,326	246,707	300,970	200,881	784,476	1,010,381	2,767,000	40,081,000	2,308,000	.....June
July.....	83,358	260,727	281,196	184,853	800,310	897,452	2,927,214	38,527,000	2,419,000	.....July
August.....	89,100	277,668	305,944	200,175	733,000	858,000	2,848,000	39,822,000	2,605,000	.....August
September.....	95,111	287,546	308,572	188,512	749,000	835,000	2,721,000	39,500,000	2,492,000	.....September
October.....	87,946	287,354	323,348	187,845	738,000	863,000	2,790,000	40,006,000	2,437,000	.....October
November.....	91,459	285,905	215,973	166,788	661,000	1,030,000	2,455,000	38,770,000	2,267,000	.....November
December.....	92,500	290,582	213,697	193,331	644,000	1,100,000	2,399,000	38,829,000	2,288,000	.....December
1926, Total.....	995,308	.....	2,922,788	.....	8,030,000	.....	31,240,000	.....	26,928,000	.....1926, Total
January, 1927.....	92,914	287,394	191,180	215,337	511,000	1,189,000	2,473,000	*39,287,000	2,367,000	.....January, 1927
February.....	88,102	294,682	172,685	234,450	546,000	1,282,000	2,729,000	38,986,000	2,091,000	.....February
March.....	98,163	325,521	222,309	235,251	525,000	1,356,000	2,412,000	39,392.000	2,369,000	.....March
April.....	88,404	318,529	273,767	219,502	561,000	1,410,000	1,978,000	38,095,000	2,237,000	.....April
May.....	87,900	329.400	319,000	222,500	599,000	1,368,000	1,809,000	37,760,000	2,599,000	.....May
June.....	95,300	293,100	347,100	232,400	677,000	1,180,000	2,283,000	38,192,000	2,487,000	.....June
July.....	90,400	305,800	334,700	214,100	747,000	928,000	2,490,000	39,647,000	2,516,000	.....July

Daily Average Runs to Stills—All Oils—Barrels

	East Coast	Appala.	Ind.-Ill.	Okla.-Kans.	Texas	La.-Ark.	Rocky Mt.	Calif.	Total U. S.	
January, 1926.*....	334,742	73,516	185,709	261,903	426,129	196,484	87,548	558,097	2,120,900	.....January, 1926
February.....	360,036	78,428	192,964	256,857	434,674	200,357	96,250	549,821	2,169,400	.....February
March.....	369,032	74,677	187,419	250,742	422,774	203,839	98,355	563,228	2,176,500	.....March
April.....	365,400	77,133	203.033	266,000	451,667	205,867	98,733	557,900	2,225,200	.....April
May.....	373,516	81,677	211,065	293,903	431,451	199,161	101,322	588,613	2,280,700	.....May
June.....	382,800	85,433	211,467	293,267	446,867	207,433	107,033	574,033	2,308,300	.....June
July.....	418.742	83,097	210,193	292,645	448,516	206,839	102,355	575,193	2,337,600	.....July
August.....	395,935	87,613	208,677	300,484	446.484	211.129	106,903	599,645	2,356,900	.....August
September.....	404,600	86,667	212,300	300,167	452,900	213,000	109,333	607,867	2,386,833	.....September
October.....	427,935	87,645	208,710	279,645	482,935	210,612	113,323	587,645	2,398,500	.....October
November.....	462,200	86,567	214,600	288,800	480,466	209,033	108,566	585,633	2,435,866	.....November
December.....	442,968	84,838	209,355	284,516	516,354	226,903	102,613	589,322	2,456,870	.....December
January, 1927.....	408,355	82,581	206,226	278,258	517,160	228,516	103,161	616,516	2,440,774	.....January, 1927
February.....	412,714	86,928	197,785	295,964	504,642	228,107	103,321	633,108	2,462,571	.....February
March.....	439,387	83,097	209,161	283,548	479,806	224,903	103,290	597,839	2,421,032	.....March
April.....	411,367	84,400	204,067	286,067	491,567	224,400	100,500	615,333	2,417,701	.....April
May.....	413,516	82,000	226,677	293,581	494,806	212,129	75,839	618,452	2,417,000	.....May
June.....	429,967	85,400	238,067	301,733	490,633	199,933	87,300	605,733	2,438,766	.....June
July.....	439,871	80,935	250,387	317,129	482,839	199,194	87,226	633,032	2,490,613	.....July

Crude Oil Stocks—By Months

1926	(Thousands of Barrels) East of Calif.	†In Calif.	Total U. S.
January	291,400	130,841	422,241
February	287,975	131,638	419,613
March	287,710	131,678	419,388
April	286,208	124,290	410,498
May	284,009	125,359	409,368
June	281,432	122,794	404,533
July	278,184	121,344	399,528
August	277,486	119,893	397,379
September	277,771	117,964	395,735
October	277,014	117,928	394,942
November	277,099	117,497	394,596
December	278,077	118,131	396,208
1927			
January	278,972	118,988	397,673
February	285,458	117,410	402,868
March	290,110	117,454	407,564
April	297,895	117,843	415,738
May	307,016	117,432	424,448
June	315,702	117,414	433,116
July	324,930	116,996	441,926

†Includes heavy fuels.

duced to a considerable degree only in the Louisiana Gulf region, although shipments were less than in June. Shipments were increased only from the Atlantic Coast refineries.

There was a small increase in daily average output of lubricating oils and shipments were 8.14 per cent less than June shipments but stocks were lowered 132,000 barrels. July shipments were larger in July than in June in the Appalachian, Indiana-Illinois, Texas and Rocky Mountain districts.

Fuel oil production was increased 2.89 per cent over June production and shipments from refineries east of California were 2.5 per cent less than June shipments. Stocks of fuel oil east of California increased 2,300,000 barrels.

Guy Peters Heads Oil-Kraft, Inc.

CINCINNATI, O., Sept. 10.—Guy Peters, who has been for 12 years with the old Moore Oil Co. of Cincinnati which was later taken over by the Pure Oil Co., is now active president of Oil-Kraft, Inc., with headquarters here.

Previous to the Pure Oil Co.'s acquisition of the Moore company, Mr. Peters was in charge of the latter's textile oil department and manager of the grease department. He was also in complete charge of the Cincinnati grease plant and the sale of grease to the jobbing and consuming trade.

For the past two years he has been special representative of the central distributing division of the Pure company, according to Roger E. Hannaford, secretary and treasurer of Oil-Kraft, Inc.

Oil-Kraft is manufacturer and marketers of greases to the jobbing trade.

Indiana Truck Corp., Marion, Ind., has established a factory branch at Tulsa, Okla., in charge of L. A. Murdoch who has been with the Dallas branch for the past several years. Lately he was district salesman at Breckenridge, Tex. The Dallas and Tulsa branches are under the supervision of Paul R. McMahan.

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CYLINDER ENGINE
CORDAGE

RED AND PALE PARAFFINE OILS

Gasoline Demand and Supply—Barrels

	Production	Imports	Exports	Domestic Shipments	Stocks End of Month
January, 1926	23,208,000	384,000	3,361,000	17,582,000	41,524,000
February	21,259,000	408,000	3,245,000	15,814,000	44,132,000
March	23,868,000	517,000	3,094,000	19,302,000	46,121,000
April	24,296,000	454,000	4,256,000	20,848,000	45,767,000
May	25,271,000	621,000	4,530,000	24,213,000	42,916,000
June	24,946,000	464,000	3,744,000	23,803,000	40,779,000
July	25,504,000	460,000	3,702,000	24,752,000	38,289,000
August	25,942,000	674,000	3,572,000	26,912,000	34,421,000
September	25,360,000	258,000	3,853,000	22,929,000	33,257,000
October	26,337,000	874,000	2,783,000	23,973,000	33,712,000
November	26,245,000	486,000	3,920,000	20,618,000	35,905,000
December	27,498,000	452,000	3,413,000	21,419,000	39,023,000
1926 Total	299,734,000	6,052,000	43,473,000	262,165,000	.....
January, 1927	27,960,000	520,000	3,557,000	17,888,000	46,058,000
February	25,024,000	416,000	3,544,000	18,240,000	49,714,000
March	27,886,000	493,000	3,219,000	22,646,000	52,410,000
April	26,577,000	377,000	3,614,000	23,371,000	52,379,000
May	26,787,000	490,000	4,468,000	26,579,000	48,609,000
June	26,616,000	590,000	4,248,000	27,799,000	43,768,000
July	28,118,000	190,000	3,223,000	29,784,000	39,069,000

Kerosene, Lubes, Wax, Fuel and Gas Oils

	Production	Imports	Exports	Domestic Shipments	Stocks End of Month
KEROSENE (Bbls.)					
January, 1926	5,122,000	.....	1,871,000	3,521,000	6,851,000
February	4,746,000	1,000	1,577,000	3,166,000	6,855,000
March	5,516,000	1,000	1,876,000	3,492,000	7,004,000
April	5,037,000	1,000	1,760,000	3,268,000	7,014,000
May	5,210,000	4,000	1,623,000	3,227,000	7,378,000
June	5,009,000	3,000	1,601,000	2,508,000	7,881,000
July	4,877,000	21,000	1,612,000	2,733,000	8,434,000
August	5,162,000	20,000	2,689,000	2,731,000	8,196,000
September	5,207,000	21,000	1,843,000	3,419,000	8,162,000
October	5,126,000	3,000	1,818,000	3,235,000	8,238,000
November	5,357,000	.....	1,943,000	3,592,000	8,060,000
December	5,399,000	.....	1,847,000	3,037,000	8,575,000
1926 Total	61,768,000	75,000	22,060,000	38,329,000	.....
January, 1927	5,113,000	.....	1,616,000	3,882,000	8,190,000
February	4,453,000	1,000	1,399,000	2,590,000	8,655,000
March	4,802,000	3,000	1,351,000	3,356,000	8,753,000
April	4,608,000	1,000	1,861,000	2,776,000	8,725,000
May	4,663,000	1,000	1,633,000	3,188,000	8,568,000
June	4,308,000	2,000	1,616,000	2,695,000	8,567,000
July	4,484,000	.....	1,376,000	2,637,000	9,038,000
LUBRICANTS (Bbls.)					
January, 1926	2,648,000	2,000	727,000	1,632,000	7,544,000
February	2,448,000	1,000	789,000	1,294,000	7,910,000
March	2,646,000	4,000	740,000	2,180,000	7,640,000
April	2,692,000	3,000	928,000	2,039,000	7,368,000
May	2,963,000	11,000	717,000	1,869,000	7,656,000
June	2,681,000	3,000	984,000	2,042,000	7,314,000
July	2,831,000	1,000	747,000	2,071,000	7,328,000
August	2,648,000	2,000	660,000	2,092,000	7,226,000
September	2,645,000	2,000	705,000	2,019,000	7,149,000
October	2,768,000	2,000	704,000	1,778,000	7,437,000
November	2,724,000	1,000	820,000	1,722,000	7,620,000
December	2,699,000	1,000	917,000	1,827,000	7,576,000
1926 Total	32,293,000	33,000	9,438,000	22,565,000	.....
January, 1927	2,570,000	81,000	864,000	1,496,000	7,867,000
February	2,345,000	.....	620,000	1,231,000	8,361,000
March	2,754,000	149,000	895,000	2,334,000	8,035,000
April	2,615,000	1,000	763,000	1,712,000	8,176,000
May	2,625,000	1,000	863,000	1,928,000	8,011,000
June	2,571,000	1,000	758,000	2,197,000	7,628,000
July	2,672,000	149,000	993,000	1,960,000	7,496,000
WAX (Pounds)					
January, 1926	53,015,000	632,000	29,061,000	18,204,000	122,773,000
February	50,307,000	668,000	28,707,000	21,075,000	123,964,000
March	55,714,000	456,000	25,005,000	24,788,000	130,341,000
April	55,371,000	647,000	31,560,000	18,715,000	136,084,000
May	56,135,000	213,000	23,968,000	19,068,000	149,396,000
June	50,673,000	833,000	27,300,000	18,348,000	155,254,000
July	54,267,000	2,089,000	30,768,000	24,138,000	156,704,000
August	54,441,000	968,000	26,906,000	20,142,000	165,065,000
September	49,228,000	252,000	29,303,000	25,463,000	159,779,000
October	56,011,000	1,384,000	28,365,000	20,884,000	167,925,000
November	54,678,000	674,000	25,164,000	21,059,000	177,054,000
December	55,950,000	1,189,000	28,410,000	20,452,000	185,331,000
1926 Total	645,790,000	10,005,000	334,519,000	252,336,000	.....
January, 1927	54,114,000	460,000	29,228,000	17,842,000	192,835,000
February	47,363,000	2,048,000	23,623,000	20,171,000	198,452,000
March	53,644,000	910,000	28,205,000	23,461,000	201,340,000
April	48,917,000	1,505,000	25,421,000	15,322,000	211,019,000
May	46,267,000	729,000	25,228,000	25,458,000	207,329,000
June	44,938,000	400,000	24,200,000	29,659,000	198,808,000
July	47,979,000	2,789,000	25,970,000	32,105,000	191,501,000
GAS and FUEL OILS (Bbls.)					
January, 1926	28,981,000	863,000	3,612,000	.....	*23,266,000
February	27,044,000	1,585,000	3,150,000	.....	*21,445,000
March	29,824,000	947,000	2,345,000	.....	*20,037,000
April	29,024,000	1,148,000	3,475,000	.....	*19,788,000
May	30,380,000	1,368,000	2,735,000	.....	*20,858,000
June	29,130,000	1,856,000	3,370,000	.....	*22,554,000
July	31,461,000	1,485,000	2,427,000	.....	*25,696,000
August	31,154,000	1,629,000	3,582,000	.....	*26,500,000
September	30,698,000	817,000	2,750,000	.....	*27,151,000
October	32,444,000	857,000	2,815,000	.....	*26,376,000
November	31,624,000	1,111,000	5,020,000	.....	*26,859,000
December	33,376,000	764,000	3,830,000	.....	*24,898,000
1926 Total	365,195,000	14,430,000	38,351,000	.....	.....
January, 1927	32,936,000	660,000	3,732,000	.....	*23,195,000
February	30,185,000	1,053,000	3,812,000	.....	*22,099,000
March	32,377,000	525,000	3,657,000	.....	*22,561,000
April	31,856,000	805,000	3,325,000	.....	*23,732,000
May	33,499,000	826,000	4,544,000	.....	*26,059,000
June	31,691,000	851,000	4,278,000	.....	*26,590,000
July	33,693,000	849,000	4,047,000	.....	*28,890,000

*These stocks for east of California only.

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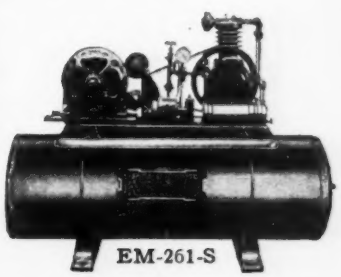

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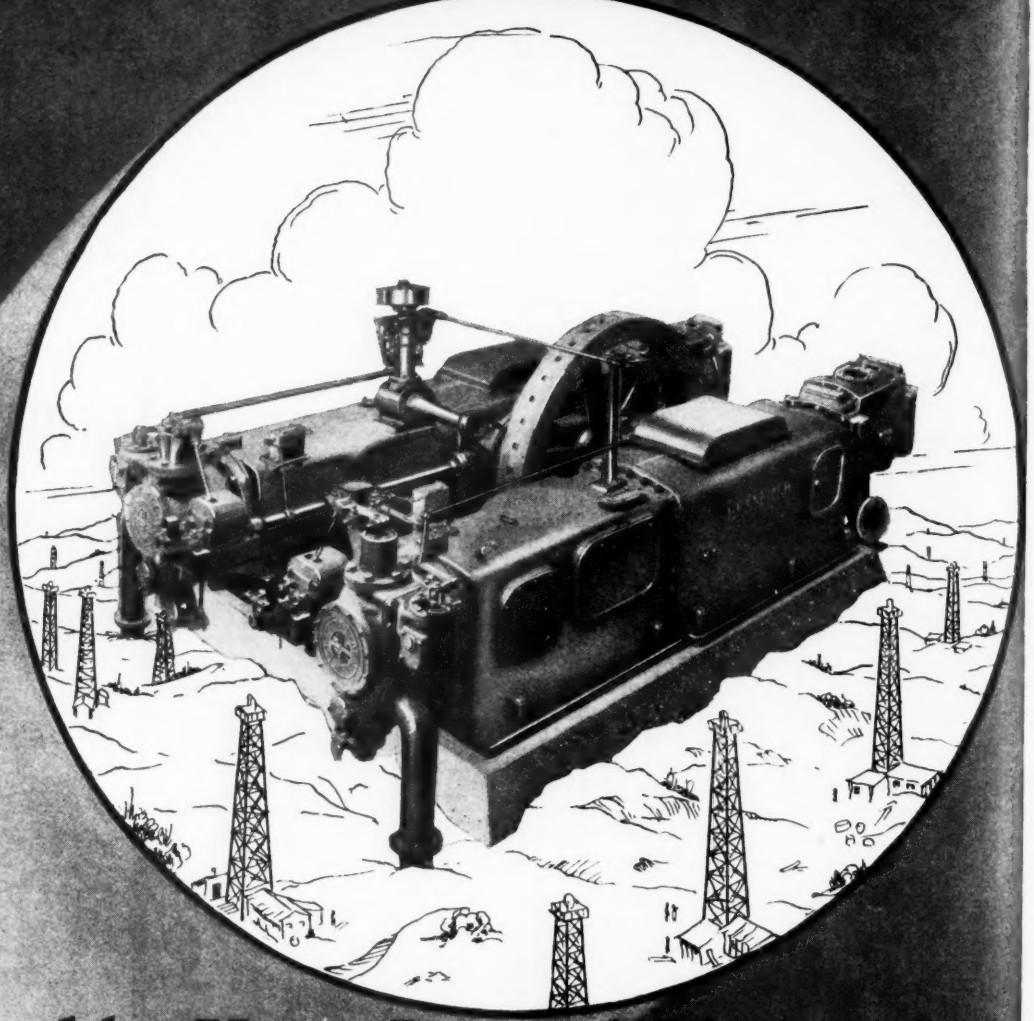

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BESSEMER OIL FIELD ENGINES – COMPRESSORS – VACUUM [illegible] – PUMPING POWERS

Oil Mining a Coming Practical Method For Secondary Production

By Lester C. Uren
Professor of Petroleum Engineering, University of California

Two Articles on Oil Mining

THIS is the first of two articles by Uren on oil mining, a method of petroleum production which has been considerably discussed the past few years but commercially applied to a very limited extent.

This article goes into conditions of the oil sand and physical conditions of the oil found there which would allow production to respond most favorably to mining operations.

The second article, to appear probably in the second issue following, deals with practical results and economic possibilities of the mining method.

THE five previous articles of this series have been concerned with methods of exploiting partially depleted oil sands through wells, by methods capable of securing a greater recovery of petroleum than is possible by utilization of forces naturally associated with the oil. In discussing the various methods reviewed, it was shown that in each case the ultimate possible recovery fell far short of the total oil content of the reservoir rock, the potential recovery in no one of the several methods exceeding, perhaps 50 per cent. Every known method of recovery in which oil is caused to flow to the surface through drilled wells of normal diameter, is probably less than 50 per cent efficient, in that upwards of one-half of the oil is left in the reservoir sand unrecoverable.

This inefficiency in methods of oil recovery in which petroleum is brought to the surface through wells is largely due to the relatively small wall space presented by the walls to the oil sand, through which drainage must occur, and to the difficulty of establishing conditions within the well which will influence the mobility of oil at remote points. The conditions attending radial flow of oil through the sands toward the well outlet are such that great resistance is interposed, which the available expulsive forces are only partially able to overcome.

DISSOLVED and occluded gas within the oil—the principal motivating agent—is difficult to control, so that it escapes to the wells, leaving a large part of the oil behind. Conditions within the oil reservoir rock can be only imperfectly visualized from the cores and data secured in drilling. Minor variations in saturation of the oil-bearing stratum, and irregularities of bedding between wells are only partially disclosed by the drilling records; hence the location and spacing of wells and the most desirable methods of well operation become matters of conjecture rather than certainty. The absence of reliable data concerning the conditions prevailing within the reservoir sand prevents intelligent development and operation of oil-producing properties, and in all probability methods of recovery are often adopted which more complete subsurface data would show to be inadvisable.

MANY of the difficulties and uncertainties responsible for the low recoveries obtained in producing oil through wells may be overcome by adopting methods which will permit of immediate access to the reservoir sand; that is, by sinking shafts or tunneling into the oil sand or the strata immediately adjacent thereto. By this means, the character and structure of the reservoir rock may be accurately determined and methods of recovery better adapted to the conditions presented may be applied. The advantages of exploiting oil deposits through mine openings have long been recognized, but the obvious technical and practical difficulties presented and the economic difficulty of competing with cheap oil from fields in "flush production," obtained by the drilling of relatively less expensive wells, has prevented the extensive application of this method of recovery.

Oil was first produced by mining methods. Later, an abundant supply was made available by the less expensive and less hazardous method of drilling wells. Within the last ten years, as a result of scarcity of petroleum in certain regions and the growing realization of the inadequacy of the reserve of petroleum producible by present methods, attention has again been directed to the possibilities of mining. General interest has also attached to the development of a mining enterprise in the Pechelbronn oil field in Alsace, which in ten years of nearly continuous operation, has demonstrated the technical feasibility of modern mining methods in exploiting petroleum, and has apparently achieved financial success. Recoveries of nearly three times as much oil have been secured from from the mine workings as were obtained by previous exploitation of the same area by means of wells, and this after the territory had been apparently drained to exhaustion by ordinary methods of recovery.

Before entering upon the discussion of principles and methods of oil mining, it will perhaps be necessary to explain that by the term "oil mining" we do not ordinarily mean the actual mining of the oil-bearing material and removal of it to the surface for extraction of the oil, but rather, the driving of tunnels, shafts, drifts and other types of mine entries either through the oil sand or in the formations immediately above or below it, in order to facilitate the extracting of the oil. The objective is to drain the oil sand in place, drainage being facilitated by the many points of contact with the oil-sand afforded by the mine openings, and the larger drainage surface of oil sand exposed in comparison with what is possible or economic in the drainage of oil through wells.

The mining method of oil recovery has been proposed particularly in the recovery of residual oil from sands that have been previously partially drained through wells. In this, the mining method is to be regarded as a competitor of the flooding, vacuum pressure-restoration and other secondary methods of recovery. It should be pointed out, however, that the mining method is not necessarily confined to secondary exploitation, but under favorable conditions, with special systems of mining designed to operate under moderate gas pressure, it may be applied also in the drainage of low-pressure virgin pools.

Physical Variables Controlling the Efficiency of Drainage Through Mine Openings

In considering the character of mine drainage, as contrasted with drainage

through wells, it is apparent that a radically different result is secured. Drainage of oil into mine workings is, for the most part, along parallel lines, while drainage into wells is necessarily along converging lines. When a drift is driven along a certain contour in the plane of the strike of an oil sand, oil in the sand on either side of the drift—both on the up-dip and down-dip sides— flows along the channels of least resistance toward the drift. The flow channels are not to be thought of as narrow, tree-like or fern-like channels, but rather, as drainage planes. That is, some particular stratum or relatively permeable layer of sand will permit of movement of the oil with less resistance than others included within the oil-bearing formation. Oil from more impervious layers, above or below this stratum, will slowly drain into it, and thence to the free drainage surfaces at the walls of the well or mine drift. But within this relatively permeable sand, there are not necessarily favored drainage channels, and in most cases, it is thought, the oil can move with equal facility in any direction. It will be observed that this conception assumes the existence of drainage "planes" rather than drainage "channels."

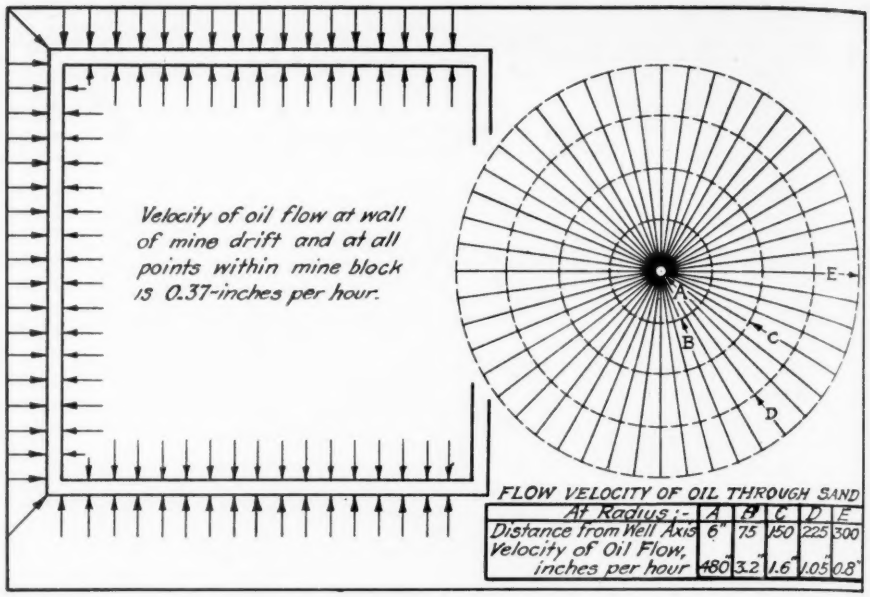
Velocity of oil flow at wall of mine drift and at all points within mine block is 0.37-inches per hour.
A
B
C
D
E
FLOW VELOCITY OF OIL THROUGH SAND
At Radius :-
A B C D E
Distance from Well Axis 6" 75 150 225 300
Velocity of Oil Flow, inches per hour 480 3.2" 1.6" 1.05" 0.8"

Fig. 1. Comparison of parallel drainage lines to a mine drift and radial drainage to a well. In computing the flow velocities, the oil sand is assumed to have a thickness of 30- feet and a porosity of 25%. The oil production is assumed to be 1000-barrels per day

WHEN a mine drift is cut through a body of oil sand, the oil flows within the drainage planes along parallel lines, roughly at right angles to the walls of the drift, these being the shortest lines, and hence those offering the lowest resistance. In the case of drainage into a well, the lines of least resistance are still straight lines, but they necessarily converge upon each other as they approach the well. The rate of flow of the oil through the sand at the wall of a 6-inch well, is 1200 times as fast as at the perimeter of the drainage radius, say 300 feet distant, and the resistance to flow is correspondingly increased.[1] in the case of parallel drainage toward the wall of a mine drainage tunnel, on the other hand, there should be no greater resistance to flow per linear unit of travel at the wall of the tunnel than far back in the sand. (See Fig. 1.)

Approaching the problem mathematically,[2] by integrating the pressure loss toward a well outlet over a 300-foot drainage radius, the pressure necessary to move oil toward a well 300 feet distant, is 3½ times as great as that necessary to accomplish flow toward the wall of a mine opening so disposed as to cut the full cross section of the productive stratum at the same distance away. This means that pressure within the reservoir sand will come into equilibrium, and drainage will cease in the case of the well outlet, long before a corresponding condition is reached with respect to the mine drift, and a greater production of oil is therefore realized in the latter case. Or, if drainage equilibrium with respect to a series of wells has been reached, it follows that there will still be sufficient pressure latent within the oil to cause flow toward mine openings driven after the wells have reached economic exhaustion. From an economic standpoint, an oil field is thus given renewed life by driving mine openings.

STUDIES of the drainage effects secured in mine workings in the Alsatian project previously mentioned, have shown that, when a drift first penetrates a body of well saturated oil sand, oil seeps from all the exposed surfaces, both in the roof and walls and also in the floor of the drift. Gradually, however, as production proceeds, flow from the upper portion of the drift ceases, and such oil as continues to drain, is obtained from the sands at or near the level of the floor. Further inspection of drainage effects in bore-holes and "cross-cuts" driven at right angles to the walls of drifts into which drainage has proceeded for a time, show that the surface of the oil in the sand is parabolic in form, gradually flattening to a level slope as the distance from the wall of the drift increases. (See Fig. 2.) As time elapses, the drainage slopes also flatten to a minimum angle, determined by the properties of the oil and the sand.

Residual oil left in the sand after drainage into wells has ceased is still under moderate pressure at points remote from the wells. Globules of gas under pressure are occluded within the oil in the sand pores, and are ready to exert such pressure as they still possess in forcing their way toward new outlets formed by the mine workings. In doing so, they carry films of oil with them and push ahead of them filaments of oil filling the capillary channels between sand grains. Movement of gas may occur toward a locality of reduced pressure with equal facility in any direction; that is, gas may move downward or laterally through the sand as well as upward, though the difference in density between oil and gas encourages movement of the latter upward, unless a considerable pressure differential causes movement in some other direction. Gravitation segregation of oil and gas within the reservoir sand is undoubtedly a factor of considerable importance in oil mining as well as in other methods of drainage.

AS A result of observation in the underground workings at Pechelbronn, Mr. P. de Chambier believes[3] that low-pressure gas existing in the form of globules within the pores of an oil sand, opposes rather than aids drainage. Oil cannot readily flow past a bubble obstructing a drainage channel. The gas bubble cannot be displaced and caused to flow along the drainage channel without undergoing a certain amount of distortion at restrictions in the channel, and this distortion consumes energy. De Chambrier suggests that slow, gravitational segregation of the oil and gas goes on in the sand, the oil sinking to the lower portion of the sand stratum, while the gas rises and fills the oil-drained, upper portion. The greater part of the oil is therefore con-

1. See a previous article of this series, NATIONAL PETROLEUM NEWS, February 9, 1927, page 76.
2. Note: This computation has been made with the aid of formulae presented by the writer in an earlier article of this series: see NATIONAL PETROLEUM NEWS, issue of February 9, 1927, formulae (3) and (4) on page 75.
3. DeChambrier, P., "Working of Petroleum by means of Shafts and Galleries," Journal, Inst. of Petroleum Technologists, Vol. 7, pp. 178-205.

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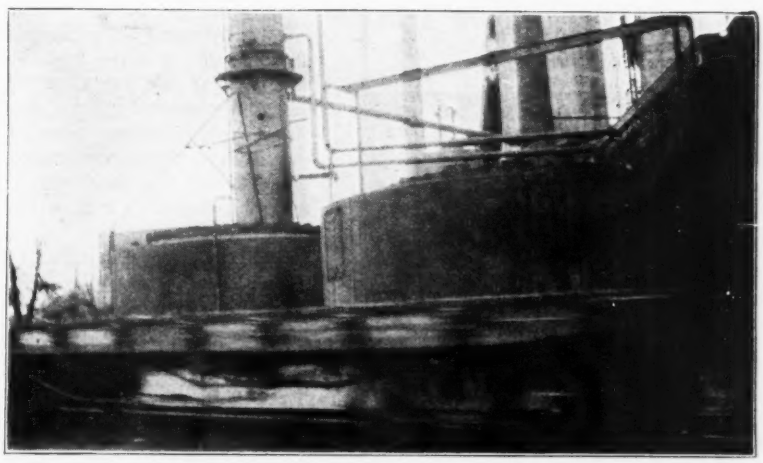

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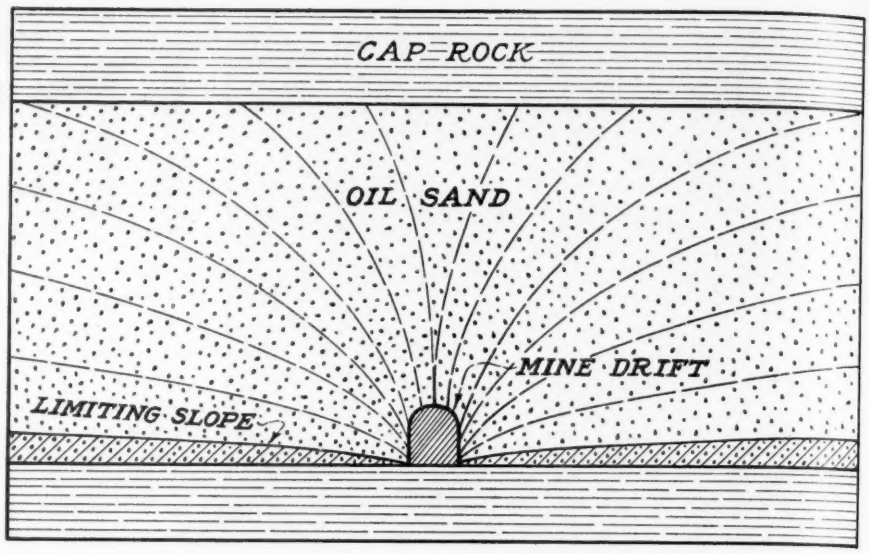

Fig. 2. Sketch illustrating successive stages in depression of oil surface in the reservoir sand in vicinity of a mine drainage drift.

centrated in and flows through the lower part of the productive sand toward the outlets.

AFTER the residual gas associated with the oil has fully expended its energy in driving oil into the mine openings, subsequent drainage must be by gravitational force. De Chambrier believes that gravitational drainage is comparatively insignificant in its effect, and that little oil will be secured after the gas pressure is entirely spent. This, however, will depend upon the thickness of the oil-bearing sand and its dip. In thick, steeply-dipping oil sands, static pressures may conceivably be developed that are capable of causing rapid flow of oil through the sand under favorable conditions. Laboratory studies conducted by the writer have shown that gravity is a potent force in accomplishing the drainage of oil from sands, it being possible to secure from 40 to 85 per cent of the saturated oil content of an unconsolidated sand by this means alone, the amount depending upon the size of grains, porosity of the sand and oil viscosity and the distance over which drainage must occur.

As previously explained, the residual oil tends to concentrate in the lower portion of the productive stratum, and the mine openings should therefore be so situated as to expose as large a drainage surface at this horizon as may be feasible. Accordingly, where drainage drifts are situated within the oil sand, they should be driven along the upper surface of the stratum immediately below, with the walls of the drift extending up into the oil sand. The most completely saturated portion of the sand will be here encountered, and all free-draining oil throughout the full cross section of the oil bearing stratum will be ultimately secured, unless continuous and impervious partings exist which might prevent gravitational seepage of the oil throughout the full depth of the productive stratum. The writer believes that impervious barriers of this character, continuous over great distances, are uncommon, and that in most cases where layers of shale are logged within a productive oil stratum, they are in reality but small lenses of local extent, and that oil might readily drain, with slight lateral movement, from the sands above to those below. This conception of shale partings and their influence in oil drainage, is illustrated in Figure 3.

AS IN any other system or method of drainage, a more complete recovery of the oil present in a sand is possible by oil mining if the sand is coarse-grained and highly porous and if the oil viscosity is low, than when the sands are fine-grained, the porosity low and the oil viscosity is high. Low permeability of the sand results in retention of oil between the sand grains, which would be more completely drained under more favorable conditions. High viscosity of the oil results in greater retention on the surface of the sand grains, since the adhesive oil film will be thicker. The porosity of the reservoir sand also has an important bearing on the economic success of oil mining, since it determines the storage capacity of the sand for oil. The more porous, unconsolidated sands may yield from two to three times as much oil as the less porous, indurated sandstones. Presumably, drainage through wells would secure about the same percentage of the total oil content in either case, so that after production through wells is no longer profitable, the exploitation of the residual oil by mining is still a more attractive proposition in very porous sands than in those less so.

Drainage tunnels should preferably be driven in the more porous portions of the reservoir sand, which contain the greater quantity of oil; and it is preferable if there is variation in the texture of the sand, to drive the entries in the coarser-grained channels where a maximum drainage effect will be secured. Oil will slowly drain from lenses of fine-grained sand into surrounding bodies of coarse-grained and relatively porous sands, but not so readily in the opposite direction. In lenticular formation, this provision may require that the drifts assume a very irregular and unsystematic course.

SINCE the residual oil in the sand tends to settle toward the lower and down-dip portions of the productive stratum, all drifts should be driven along the "strike" of the bed—that is, at right angles to the dip—and in the lower portion of the reservoir sand. In thick oil sands, no effort need be made to expose the full thickness of the sand, for, if the drift is properly placed, the full cross section of the sand will be effectively drained due to gravitational influence. The only exceptions to this rule will occur in cases where impervious "partings" extend over considerable areas, and where the lower portion of the reservoir sand is composed of fine-grained sand-stones of low porosity.

Contrary to generally accepted theory concerning the influence of structural position on productivity, it seems probable that openings located well down the dip of the structure will, in the case of mining, be more productive than in locations near the structural crest. At the crest of an anticline or dome, due to the relative abundance of gas, oil recovery through wells will probably have been more complete than down the flanks of the structure, toward the edges of the deposit, where gas expansion has been less active in expelling oil. Furthermore, if gravity plays an important part in drainage through mine openings, we might expect a mine opening to secure the greater part of its oil production from up-dip portions of the reservoir sand. Gravitational drainage is, for the most part, in the direction of the dip of the oil stratum, hence the drainage drifts should be driven well apart on the plane of the dip, in order that each drift may have an uninterrupted expanse of oil sand above it upon which to draw for its production. This is particularly true in steep-dipping formations in which gravity plays a more important role. The steeper the dip of the formation, the further apart the drifts may be placed without loss in drainage efficiency.

Conditions Limiting Use of Mining Methods of Oil Recovery

IN DETERMINING whether or not mining methods may be used in the exploitation of a particular deposit, it will be necessary to study the conditions presented and consider them carefully with respect to the practical limitations imposed in the driving of mine openings into oil-bearing rocks.

Mining methods are not well adapted to conditions under which high gas pressures may be suddenly encountered. The possibility of a sudden flow of high-pressure natural gas into restricted mine openings in which men are at work, would be a prohibitive condition. However, oil deposits which have been previously exploited by flowing and pumping methods through drilled wells, and have reached or are approaching a condition of economic exhaustion by this means, under ordinary circumstances, are so far exhausted of their natural gas that

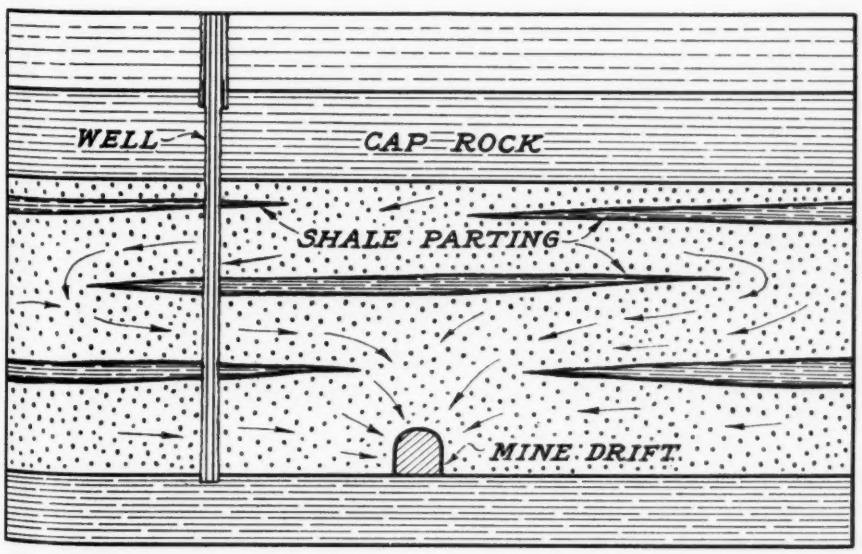

Fig. 3. Though the log of the well indicates three impermeable shale "breaks," oil may drain by circuitous channels from the entire thickness of the sand to the mine drift below the lowermost "break"

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the possibility is remote of mine openings driven into them encountering a sudden flow of high-pressure gas. Use of mining methods in which the mine drifts are driven directly through the sand body would ordinarily appear to be restricted to oil deposits that have reached this condition in the normal course of development and exploitation.

The ordinary mining methods are, therefore, not to be regarded as competitors of present methods involving the drilling and production of oil through wells, but rather, as supplemental methods to be applied when it is no longer profitable to produce through wells by ordinary methods which depend upon natural gas expansion. However, certain methods of mining, to be described later, in which the mine drifts are driven outside of the oil sand, would appear to be free of this limitation, at least in so far as moderate gas pressures are concerned.

IN SOME oil fields, the edge-waters are under high hydrostatic pressure, and as the gas pressure and a part of the oil are exhausted through wells, the high-pressure edge-waters encroach and flood the oil sands. Under such conditions, mining would be difficult and costly, for water flows more freely through the sands once water-saturated channels of communication have been established, and it might be found impractical to pump it out of the mine workings rapidly enough to permit of conducting mining operations. In such cases, the fluid draining from the sand would be mostly water, with comparatively little oil. Water-saturated beds above the oil sands, which must usually be penetrated by the shafts, might also be productive of great volumes of water, making progress in shaft-sinking difficult and costly. However, methods are available for sinking shafts through water-bearing formations, so that shaft-sinking under such conditions is technically and practically feasible if economic considerations warrant.

Some oil sands are so poorly cemented that they flow like "quicksand" under slight gas or hydrostatic pressure. This is especially true if the oils are heavy and viscous. Extraction of the oil by mining would be difficult under such conditions, for timbering or shaft or galley supports capable of restraining "running ground" are expensive to install and costly to maintain. The oil-drainage systems, pumps, etc., would be continually becoming clogged with sand, and the possibility of sudden "heaving" of sand in suspension in oil into the mine workings would be a serious hazard.

Many believe that oil-mining operations must be limited to comparatively shallow depths, but depth of the oil sand below the surface is only an economic barrier, it being possible to carry on mining operations at depths as great as any yet attained in well-drilling, and through any kind of rock formation. There are a number of instances of successful mining at depths in excess of 5,000-feet in metal mining; and generally speaking, the same methods may be applied as are appropriate for shallower depths. However, the cost per unit of excavation increases moderately with depth, and working conditions are generally somewhat more difficult.

THOUGH such conditions as are outlined in the foregoing paragraphs may make mining operations uneconnomic or even impossible in particular instances, there are many partially exhausted oil fields in which the gas pressure is not too great, in which water is not present to excess, and in which the sand conditions are generally favorable for successful mining operations. If these conditions are favorable, it is only a question of the cost of conducting mining operations, the yield of oil to be expected, and the price that may be realized for the product, to determine whether or not a mining project will be economically feasible. Of course, there will be other considerations, such as climatic conditions, accessibility and proximity to markets, labor, material and power supply, attitude of government, etc., but these apply to any method of exploitation and are not inherent to mining methods in particular.

WHERE conditions are favorable for the exploitation of oil deposits by mining, there are still factors which make of it an undertaking of somewhat different character than the mining of any other mineral product. One of the principal distinctions is found in the problems of ventilation and fire prevention that are occasioned by the presence of an abundance of inflammable, explosive and occasionally poisonous gases and vapors. No matter how thoroughly exhausted of gas the oil sands may have become in the previous production of oil and gas through wells, there is always sufficient gas retained in the oil sands, which is liberated in the course of mining operations, to present a very definite mining hazard. Adequate ventilation

Summary and Conclusions

IT HAS been shown that drainage of oil through mine openings offers a means of securing a more complete recovery of the oil content of a reservoir sand than is possible by methods of production now used. In the pioneer Alsatian oil mine, the total recovery has been increased nearly 300% in comparison with the ultimate production found to be possible by ordinary methods of flowing and pumping through wells.

* * *

The reasons for the greater recovery efficiency of the mining method are explained as being due, primarily, to a fundamental difference in the character of drainage and the provision of a greater drainage surface within the oil sand, thus permitting the oil to flow through the reservoir sands with less resistance than is possible in drainage into wells.

* * *

In reviewing the factors which control the efficiency of oil drainage by this method, it is found that residual gas pressure and gravitation are the primary forces operative, and that in securing the maximum recovery the mine openings should be driven in such a position as to tap the lowermost portions of the oil-saturated sand. Drifts should be located in the more permeable oil-sand channels. The most favorable conditions are found in steep-dipping, highly porous, coarse-grained sands of uniform texture, producing oil of low viscosity.

* * *

Certan physical conditions which occasionally characterize petroleum deposits promise to make mining operations within the oil sand difficult: particularly, high gas pressure, water under pressure associated with the oil-bearing stratum as edge-water or top-water, and unconsolidated sand conditions leading to difficult problems in support of mine openings. Depth is not considered to be a factor of such great importance as is commonly believed. Ventilation of mine workings and precautions against fire and explosion of mine gases, are considerations of primary importance, but their satisfactry solution is assured. Conditions attending the conduct of oil-mining operations are admittedly difficult and somewhat hazardous, but there is no question that such operations can be safely and successfully conducted at reasonable cost with the aid of modern mining methods. That the method is practical, is demonstrated by a successful project that has been in operation for upwards of ten years.

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of the mine workings to so dilute the gases and vapors produced as to render them non-explosive, non-inflammable and non-toxic to the mine workers, is the first and foremost requirement of successful oil mining. Satisfactory ventilation, however, is merely a matter of forcing sufficient air into the workings, particularly at the working faces where the gases and vapors are produced in greatest quantity.

While we may plan a system of ventilation that will adequately dilute objectionable gases to a point where they become innocuous under all ordinary circumstances, there is always the possibility that an unusual and unexpected flow of gas at some working face will produce dangerous concentrations. With this possibility in mind, the working conditions must be so devised that an explosion or fire will not result, and so that workmen may readily find refuge from excessive concentrations of gas in case of necessity.

THE system of lighting employed under-ground must avoid the use of naked lights or methods of illumination that under any circumstances may be productive of sparks hot enough to ignite gas. If it is possible to avoid their use, no explosives should be employed within the oil sand for the same reason, though it is possible that the "permissible explosives" used in coal mines may be adapted to this purpose where necessary. Drills or other working equipment that may form sparks when applied to the rock formation must be avoided.

Even when the menace of fire and explosion is nullified by adequate ventilation and other precautionary measures, working conditions in an oil mine are far from pleasant. With oil dripping from the timbering, exuding from the walls and working faces, and slowly draining from the broken rock and sand in process of removal from the mine, the gangways and all equipment under-ground soon become coated with oil. The nature of the work performed under-ground requires that the workers also become covered with oil. Under-ground conditions are such that special inducements in the way of shorter working hours and higher-than-normal wages must be offered to secure adequate labor. It is conceivable that in certain parts of the world the problem of recruiting and maintaining a working force might become a determining factor in the success of an oil-mining enterprise.

The difficulties in the way of successful production of petroleum through under-ground mine workings appear so formidable that the reader might well be justified in concluding that such a method of exploitation will generally be found impractical and not likely to be seriously contemplated in competition with present methods of oil recovery. That this conclusion is unjustified however, is amply proven by the results attained in the case of the pioneer present-day enterprise of this character, namely, the Pechelbronn project previously mentioned. Here five shafts have been sunk to the oil-producing sands, many miles of tunnels have been driven directly through the oil sands, and all of the problems of ventilation, drainage, lighting, hoisting, tramming, timbering and "breaking ground" have been satisfactorily solved.

Nearly 500 men are employed in this mine, surprisingly few accidents have occurred, and the percentage of fatalities due to under-ground accidents has been no greater than in the average American coal mine. Upwards of a million barrels of oil have been produced at a cost that will compare favorably with the cost of oil concurrently produced from the wells in the same field. Production is increasing and was recently at the rate of about 700 barrels per day, and as the scale of operations is increased the project will doubtless become more profitable.

This is an impressive record, and one which will command the attention of oil producers the world over in determining whether or not mining methods may be profitably employed in other fields where conditions are favorable, and where the lower limit of profitable exploitation by ordinary methods has been reached. The oil producer will particularly wish to know how mining methods will compare in efficiency and economy with other methods, such as water-flooding or the pressure-restoration methods, which might also be under consideration as a means of stimulating recovery.

Bennett Sales Force Meets

MUSKEGON, Mich., Sept. 10.—A general get-together meeting and summer frolic of the sales force of Bennett Pumps Corp. was held here Aug. 15, 16, 17 and 18.

Salesmanship and problems confronting salesmen and their customers were the leading subjects for discussion. Co-operation was the subject of a talk by S. H. Frensdorf while T. B. Bennett pointed out sales arguments in engineering features that mark the company's product. Other speakers were: Jerry Tyler, L. A. Prescott, W. V. Bowers, Joe Stevens, Jr., Stanley Foran, Earl Kent, J. T. Walsh, S. B. Merry, D. B. Coey, A. E. Tabor and Earl Fay, all of whom are members of the Bennett company excepting Mr. Bowers, Mr. Stevens and Mr. Foran. A banquet Aug. 18 at the Occidental Hotel closed the meeting.

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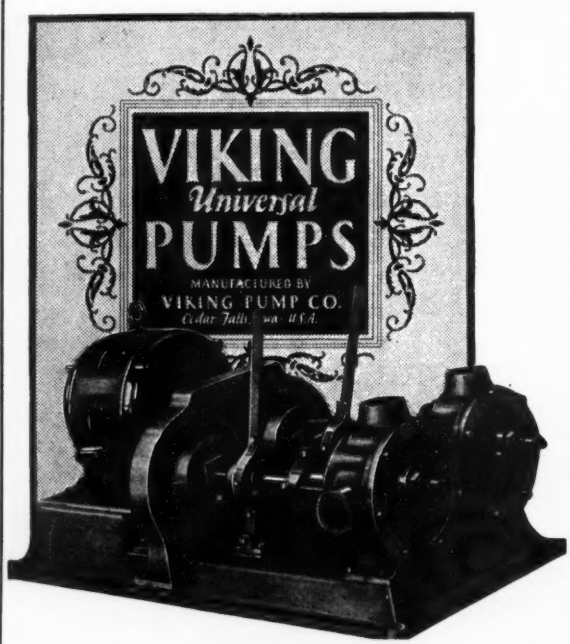

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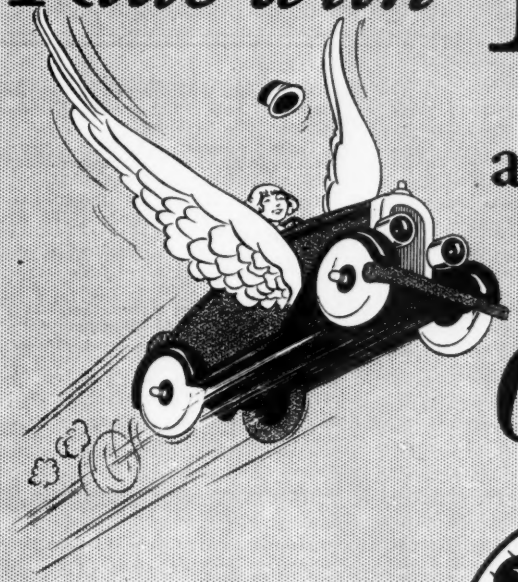

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Roster of Oil Associations

National Petroleum News

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Amercian Chemical Society, Petroleum Division, Mellon Institute, Pittsburgh, Pa. Secretary, George A. Burrell, 1501 Columbia Bank Bldg., Pittsburgh, Pa.

American Gas Association, Graybar Bldg., 420 Lexington Ave., New York City. Secretary Alexander Forward.

American Institute of Mining and Metallurgical Engineers, Petroleum Division. 29 West 39th St., New York. Chairman, Petroleum Section, F. Julius Fohs.

American Oil Burner Association, 350 Madison Ave., New York City. Executive Secretary, Leod D. Becker.

American Oil Chemist Society, 705 Tchoupitoulas St., New Orleans, La. Secretary-Treasurer, J. C. Helm.

American Oil Men's Association, 624 South Michigan Ave., Chicago, Ill. James A. Gilmore, Secretary.

American Petroleum Institute, 250 Park Ave., New York City. Secretary, R. L. Welch.

American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Secretary-Treasurer, C. L. Warwick.

Arkansas Petroleum Club, Secretary, James P. Lavery, Petroleum Supply Co., El Dorado, Ark.

Arkansas-Tennessee Oil Marketers Association. Secretary, R. E. McKellar, care Diamond Oil Co., Memphis, Tenn.

Association of Oil Jobbers of Mississippi, Jackson, Miss. President, R. C. Clark, Independent Oil Co., Tupelo, Miss.

Association of Natural Gas Supply Men, Inc., 905 Oliver Bldg., Pittsburgh, Pa. Secretary, Guy F. Batchelor.

Association of Natural Gasoline Manufacturers, 504 A-B Cosden Bldg., Tulsa, Okla. Secretary, A. V. Bourque.

Association of Producers of Petroleum in Mexico, 17 Battery Place, New York. Director, Guy Stevens.

Association of Producers of Petroleum in Venezuela, 17 Battery Place, New York City. Director, Guy Stevens.

Chamber of Mines & Oils of California, 206 So. Spring St., Los Angeles, Calif.

Cincinnati Oil Club. Secretary, George H. Siemer, Merchants Oil Co. Cincinnati, O.

Detroit Petroleum Club. Secretary, Frank McSweeney, Cities Service Oil Co., General Motors Bldg., Detroit, Mich.

Eastern Kentucky Oil Producers Association, Ashland, Ky. Secretary, David Browning.

El Paso Petroleum Club. President, A. L. Behringer, Home Oil Co., El Paso, Tex.

Georgia-Alabama Independent Petroleum Marketers Association. Secretary-Treasurer, W. L. Moore, Wofford Oil Co. of Georgia, Atlanta, Ga.

Georgia Independent Oil Marketers Association. Secretary-treasurer, J. K. Ezell, American Oil Pump & Tank Co., P. O. Box 982, Atlanta, Ga.

Greater Chicago Oil Men's Club. Secretary, Mel Keim, Apex Motor Fuel Co., 4555 W. 26th St., Chicago, Ill.

Gulf Coast Independent Oil Producers Association, 403 Goggan Bldg., Houston, Tex. Secretary, T. L. Smith, Jr.

Illinois Petroleum Marketers Association. Secretary, G. A. Primm, Chamber of Commerce Bldg., Springfield, Ill.

Independent Oil Men of America, 624 S. Michigan Ave., Chicago, Ill. L. V. Nicholas, President.

Independent Oil Men's Association of Massachusetts. Secretary, F. E. Bergfors, care Quincy Oil Co., Quincy Adams, Mass.

Independent Oil Men's Association of New England. Secretary, I. H. Farrar, Berkshire Oil Co., Worcester, Mass.

Independent Oil Marketers Association of Atlanta, Ga. Secretary, J. H. Smitha, care Community Oil Co., Atlanta, Ga.

Independent Petroleum Marketers of Middle Atlantic States. Secretary, E. Walter Hudson, Cameron & Paxton Sts., Harrisburg, Pa.

Indiana Independent Petroleum Marketers Association. Field Secretary, Sam T. Hurd, Hotel Severin, Room 306, Indianapolis, Ind.

Iowa Independent Oil Men's Association, 225 Fifth St., Des Moines, Ia. Secretary, M. L. Long.

Kansas Oil Men's Association, 423 First National Bank Bldg., Wichita, Kan. Secretary, J. A. Motter.

Kentucky Oil Men's Association, Inc., 610 Trust Co. Bldg., Lexington, Ky. Secretary, Thomas S. Scott.

Kentucky Petroleum Marketers Association, 3401 Bank St., Louisville, Ky. Secretary, L. J. Connelly.

Maine Independent Oil Dealers Association. President, Theodore E. Emery, president, Kennebec Oil Co., Augusta, Me.

Michigan Independent Oil Men's Association, 1005 Grand Rapids National Bank Bldg., Grand Rapids, Mich. Secretary and Treasurer, Wayne C. Hughes.

Mid-Continent Oil & Gas Association, 505 Cosden Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Kansas-Oklahoma Division, 505 Cosden Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Louisiana-Arkansas Division, 724 Giddens-Lane Bldg., Shreveport, La. Secretary, Joseph B. Elam.
Texas Division, P. O. Drawer 1567, Dallas, Texas. Secretary, J. P. Laney.

Minnesota Petroleum Association, 638 Builders Exchange, Minneapolis, Minn. Secretary, Paul E. Hadlick.

Mississippi Oil Men's Association. Secretary, J. J. McEwen, 501 Capital National Bank Bldg., Jackson, Miss.

Missouri Oil Men's Association, 217 Dwight Bldg., Kansas City, Mo. Secretary, George S. Allee.

National Association of Independent Oil Producers, 414 Atlas Bldg., Tulsa, Okla. President, William H. Gray.

National Gasoline Dealers Association, Inc., 280 Madison Ave., New York City. Secretary, Thomas P. McKee, Jr.

National Petroleum Association, Munsey Bldg., Washington, D. C. Washington Counsel, Fayette B. Dow.

Natural Gas Association of America, 905 Oliver Bldg., Pittsburgh, Pa. Secretary, Guy F. Batchelor.

Natural Gas & Petroleum Association of Canada, Chatham, Ont., Canada. Secretary, S. A. Morse.

Nebraska Independent Oil Men's Association, 816-817 Terminal Bldg., Lincoln, Neb. Secretary, C. M. Sutherland.

New Jersey Oil Trade Association, 196 Halsey St., Newark, N. J. Secretary, J. H. Chambers.

New York State Oil Producers Association, Wellsvilie, N. Y. President, Lewis H. Thornton.

New York State Petroleum Marketers Association, 1201 So. Salina Co., Syracuse, N. Y. Secretary, Benjamin A. Javitz.

North Carolina Independent Oil Jobbers Association, Greensboro, N. C. Secretary-Treasurer, E. M. Brown, Carolina Oil Co., Lincolnton, N. C.

North Central Ohio Petroleum Club, 489 Cherry St., Marion, O.

North Dakota Petroleum Association. Acting head, H. M. Wilson, care International Oil Co., Minot, N. D.

Northwest Independent Oil Association. Secretary, C. H. Brown, care Arro Oil & Refining Co., Lewiston, Mont.

Northwestern Pennsylvania Oil Producers Association, 78 Main St., Bradford, Pa. President, A. Edward Booth.

Ohio Gas & Oil Men's Association, 811 First National Bank Bldg., Columbus, O. Secretary, William H. Thompson.

Ohio Petroleum Marketers Association, 606 Commerce Bldg., Columbus, O. Executive Secretary, W. A. Milne.

Oil Trade Association of Baltimore, Md. Secretary, Arthur B. Gardner, 309 East Falls Ave., Baltimore, Md.

Oil Trade Association of Philadelphia, Inc. Secretary, Howard M. Rogers, 123 Arch St., Philadelphia, Pa.

Oil Trades Association of New York City, Inc., 35 So. William St., New York City. Secretary, Joseph C. Smith.

Oklahoma Oil Jobbers Association, 416 Fidelity National Bank Bldg., Oklahoma City, Okla. Manager, Secretary and Treasurer, Arthur J. McClelland.

Oklahoma Oil Marketers, Inc., P. O. Box 755, Enid, Okla. Secretary, W. W. Blackburne.

Okmulgee District Oil & Gas Association, Okmulgee, Okla. Secretary, Charles I. O'Neill.

Osage Oil & Gas Lessees Association, 505 Cosden Bldg., Tulsa, Okla. Secretary, Harry H. Smith.

Pennsylvania Grade Crude Oil Association, 209 Chambers Bldg., Oil City, Pa. Secretary, R. J. Alexander.

Petroleum Club of Central New York. Secretary, George R. Casey, Crown Oil Co., Syracuse, N. Y.

Pierce County Independent Gasoline & Oil Dealers Association. Executive Secretary, J. H. Stine, 1009½ Pacific Ave., Tacoma, Wash.

Purchasing Agents Association of Tulsa, 307 So. Cincinnati St., Tulsa, Okla. Secretary-treasurer, H. M. Cosgrove.

Rocky Mountain Independent Oil Men's Association (formerly Colorado Petroleum Club), 411 Exchange Bldg., Denver, Colo. Secretary, A. Oberholtz, Jr.
Rocky Mountain Oil & Gas Association, P. O. Box 1559, Casper, Wyo. Secretary, C. W. Sparr.

Rocky Mountain Oil & Gas Association, Montana Chapter, 222 Ford Bldg., Great Falls, Mont. Secretary, Walter F. Brittan.

South Dakota Independent Oil Jobbers Association, Sioux Falls, S. D. Secretary, F. H. Buehler, care Dacotah Oil Co., Madison, S. D.

Southern Petroleum Jobbers Association. Secretary, D. C. Patterson, Camden, S. C.

St. Louis Petroleum Club, 1430 So. Vandeventer Ave., St. Louis, Mo. Secretary, R. F. Leinberger, Blackmer Pump Co., St. Louis, Mo.

Springfield Petroleum Club, Secretary, Ross Lock, c/o Lock Bros., Oil Co., Springfield, Ill.

State Executives Club. Secretary, Paul E. Hadlick, Minnesota Petroleum Association, 638 Builders Exchange, Minneapolis, Minn.

Technical Club of Oklahoma, 208 Fisher Bldg., Tulsa, Okla. Secretary, R. I. Ginter.

Tennessee Independent Oil Men's Association, Secretary, G. H. Alsup, Jr., care Consumers' Supply Co., Murfreesboro, Tenn.

Texas Independent Oil Men's Association, Secretary, L. A. Greene, care Radio Petroleum Co., Forth Worth, Tex.

Virginia Independent Oil Men's Association, 511 Union Trust Bldg., Petersburg, Va. Secretary, treasurer and field representative, W. M. Eller.

West Virginia Oil and Natural Gas Association, Fairmont, W. Va. Secretary-Treasurer, Edwin Robinson.

West Virginia Oil Marketers Association, 513 Peoples Exchange Bank, Charleston, W. Va. Secretary and Treasurer, D. E. Frierson.

Western Petroleum Refiners Association, 504 Cosden Bldg., Tulsa, Okla. Managing Director, Howard Bennette.

Western Reserve Petroleum Club. President, R. C. Heil, Commercial Oil Co., 2545 E. 83rd St., Cleveland, O.

Wisconsin Independent Oil Jobbers Association. Secretary, J. M. McLaughlin, Bartles-Maguire Oil Co., Milwaukee, Wisc.

Wyoming Petroleum Club. Secretary, G. H. O'Donnell, 847 So. Lincoln St., Casper, Wyo.

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Our Industry — A Page of Facts and Personalities

National Petroleum News

By Paul Wagner

W. N. FINNEGAN, Jr., statistician in the executive offices of Humble Oil & Refining Co., Houston, is back at his desk after a vacation spent in west Texas.

* * *

ERNEST J. NICKLOS, manager of Tulsa division production activities of The Texas Co., embracing Oklahoma, Kansas and Kentucky, spent his vacation on the Pacific Coast. Before aligning himself with The Texas Co., several years ago, Mr. Nicklos was an individual producer and drilling contractor in the Tampico district.

* * *

JAMES ANDERSON, vice president of Humble Oil & Refining Co., in charge of crude oil storage and transportation, left Houston headquarters early in September for New York, on business. He expected to be away several weeks, taking his vacation before returning to his desk.

* * *

J. H. PRESSLEY, assistant secretary, Sun Oil Co., Dallas, spent his vacation at his old home in Greenville, South Carolina.

* * *

PRESIDENT J. S. CULLINAN of the American Republics Corp., holding company for the various Cullinan enterprises in the oil and manufacturing industries, expects to remain in the east until October. His plans then call for return to his Houston home.

* * *

W. C. TROUT, vice president and general manager of the Lufkin Foundry & Machine Co., Lufkin, Texas, spent his vacation in Canada.

* * *

WARNER CLARK, now of Colorado City, Texas, is in general administrative charge of operations of the California Co., in the Lone Star state. He recently returned to the United States after service in foreign fields for the parent Standard Oil Co. of California. His most recent foreign post was in Ecuador.

* * *

P. H. WILLIAMS and family of San Angelo, Texas, expect to remain in the oil business, at least for the present. Williams recently denied a reported sale of their extension well to the World pool, northern Crockett county, and the 244 acres controlled by the family. The well, mapped as No. 1 L. P. Powell, has been averaging better than 500 barrels daily and is the best ever to have been completed in the field.

* * *

DAN J. MORAN, vice president of The Texas Co., in general charge of production, has returned to New York headquarters after an inspection trip that covered virtually all the company's properties in this country and after taking a short rest at Marlin, Texas.

* * *

WALTER M. DUNHAM, globe trotter extraordinary and oil statistician, is back in the United States after his tenth South American trip and his third visit to Brazil. Mr. Dunham, at 71, is mentally alert and in good physical trim. His recipe against gray hairs and wrinkles under the eyes, he says, is:

"When you've done anything you're sorry for be glad of it."

At his age, Mr. Dunham hasn't been able to avoid gray hairs, but he insists that none of them resulted from worry.

* * *

THE J. K. HUGHES Developing Co., with Mexia headquarters, has opened west Texas offices at San Angelo with M. T. Hill in charge of land work and D. W. Boliver heading scouting activities. The J. K. Hughes interests plan to extend operations in west Texas outside the World pool, in northern Crockett county, where they now have small production.

* * *

E. H. BUCKNER, president of the Houston Oil Co. of Texas, with Houston headquarters, spent his vacation in Colorado. Charles McKinney, general manager of the Houston Pipeline Co., gas subsidiary of Houston Oil Co. of Texas, spent his vacation in the north and east.

* * *

J. E. WEDDELL of the pipeline department of the Mexican Gulf Oil Co., at Tampico, is spending a three months vacation in England and Scotland.

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Goodall Semi-Metallic Hose is unequalled in its ability to withstand high pressures and hard usage. The tube of highest grade rubber resists the excessive wear of sand-laden slush mud. The heavy steel armor holds highest pumping pressures, with a large margin of safety, and protects against all outside wear and damage. Patented Ball Joints make "G.S.M." the most *flexible* metallic hose, and the only one which positively cannot be kinked nor have internal clearance interfered with.

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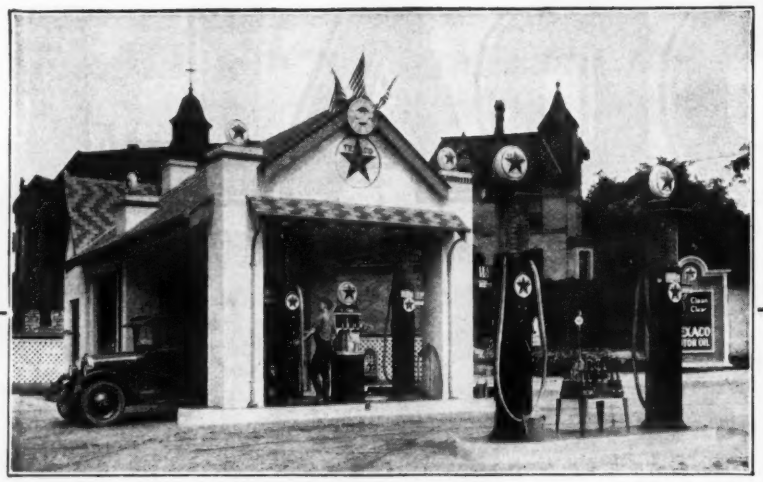

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New Stations Built or Being Built

Van Buren, Ark.—J. C. Neilson is completing filling station and garage.

Davenport, Ia.—Byron Rumsey purchased property for filling station.

Aledo, Ill.—Standard Oil Co. of Indiana will erect filling station.

Breckenridge, Tex.—Daniel Motor Co. is erecting building which will include filling station.

Coalgate, Okla.—Tom's Filling Station is being completed here by Hensen Oil Co.

Little Falls, Minn.—John Hancock Oil Co. will erect service station.

Davenport, Ia.—Bruns Seed Store will build filling station.

Iowa City, Ia.—Skelly Oil Co. will build filling station.

Wapello, Ia.—Virgil Westfal and John Wykert, of Oakville, Ia., will erect filling station here.

Albia, Ia.—Roxana Petroleum Corp. will build filling station.

Madison, Wis.—Saul Sinaiko will build filling station.

Brownsdale, Minn.—Lansing Co-Operative Oil Co. will build filling station.

Ada, Minn.—Ada Oil Co. has been organized here by Isidore Roesch, John Roesch and John Prigge, and bulk and filling station will be built.

Marion, O.—J. H. McGinty, of Mansfield, O. will build filling station here.

Dayton, O.—The Gem City Oil Co. will build filling station.

Granville, O.—Two filling stations will be built here, one each by L. N. Flory and George Futerer.

"Wildcat Committee" For Houston

HOUSTON, Sept. 8.—The policy of forming "wildcat committees" of the Texas division of the Mid-Continent Oil & Gas Assocation, for entertainment purposes, has been extended to Houston. John R. Suman, general production executive of Humble Oil & Refining Co., was named chairman by President James D. Collett of the association. Others named on the committee include T. J. Donoghue, vice president of The Texas Co., Joe H. Russell, assistant production manager, Gulf Production Co., Adrian C. Moore, division manager, Rycade Oil Corp.; G. L. Noble, Jr., of The Texas Co.; R. C. Kuldell, operating executive of the Hughes Tool Co.; L. L. Brundred of the National Supply Co.; and R. L. Dudley of the Gulf Publishing Co. Because of Mr. Brundred's transfer to California it will be necessary to name a successor for him.

TULSA—Eastern Torpedo Co. will maintain west Texas headquarters at Odessa, according to D. A. Koonz of Tulsa, when on a recent trip into the territory. The location of a plant, about 10 miles west of Odessa, will be convenient to the oil fields of Crane, Upton, Winkler and Pecos counties. Barton Torpedo Co. recently established a magazine near Odessa.

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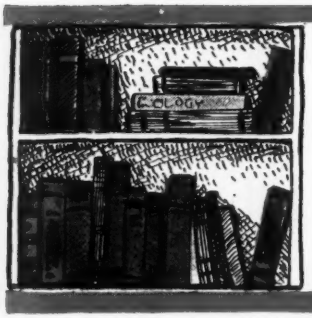

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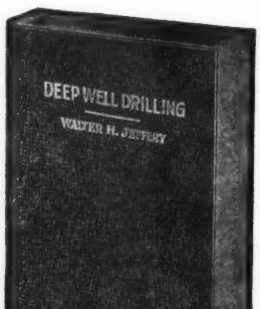

The second edition of "Deep Well Drilling" by Walter H. Jeffery is just out. The material in the first edition has been rewritten thruout with several new chapters on improvements in the art of drilling.

"Deep Well Drilling" discusses exhaustively cable tool drilling, rotary drilling, core drilling in all their phases; tells how to fish for lost tools; how to case, how to use packers, how to cement and how to shoot; how to plan operations intelligently; specify material, etc.

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Among the subjects discussed are: Manufacturing process; Refinery site; Stills; Condensers; Heat exchangers; Cracking; Chemical treatment; Wax plants; Filtering; Cold settling; Compounding; Storage; Volume measurements; Bulk transportation; Packages; Power plant and boiler house; Acid recovery; Fire protection.

475 pages—263 illustrations—$5.00

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ON THE LAZY BENCH

National Petroleum News

Maybe He Helps Out at Home With the Dishes, Too

O. W. Skirvin, vice-president and general manager of the American Oil & Refining Company at Ada, Okla., is one very busy man. Aside from his duties as vice-president of his company, his duties as director of the policies of the MacThwaite Gas Company, gas franchise holders for the city of Ada; his duties of supervising the purchase of materials for all the companies in which he is interested, his duties as "pusher" for all the drilling wells his company is interested in in the Ada field, his duties as supervisor of the new American Building in Ada, he finds but little time to waste on golf and supply men. Very lucky is the man who can find him when he is not busy. Mr. Skirvin is a graduate of the School of Petroleum Engineering, University of Pittsburgh.

—*Bridgeport Driller*

* * *

Had Your Iron Today?

Grocer: "Here's your flypaper. Anything else today?"

Rastus: "Yas-suh, I wants 'bout six raisins."

Grocer: "Do you mean six pounds?"

Rastus: "Naw, suh, about six, jes' enough fo' decoys."—*Loreco Diamond.*

* * *

"My hands are very soft. I keep them that way by sleeping with gloves on."

"And do you sleep with your hat on, too?"—*Barnsdall.*

* * *

"A man is never older than he feels," declared the ancient beau, bravely. "Now I feel as fresh as a two-year old."

"Horse or egg?" asked the sweet young thing, brightly.

—*The Leaderite*

* * *

Where the Names Come From

That it is dangerous to proceed in any undertaking until all relative facts have been ascertained, and that half-truths are often most misleading is well illustrated by the story of the mother who was on the lookout for a good name for her child and saw on the door of a building the word "Nosmo." It attracted her, and she decided that she would adopt it. Some time later, passing the same building, she saw the name "King" on another door. She thought the two would sound well together, and so the boy was baptized "Nosmo King Smith." On her way home from the church where the baptism had taken place, she passed the building again. The two doors on which she had seen the names were now closed together, and what she read was not "Nosmo King", but "No Smoking."

—*Magnolia Oil News*

* * *

Surprise All Around

"Where'd you all get that derby hat?"

"Hit's a surprise fum mah wife."

"A surprise?"

"Ah cum's home de other night unexpected an' found hit on de table."

—*Bit and Tongs*

* * *

How Many Early Settlers in Your Territory?

J. E. Bald, our division credit manager, recently visited one of our stations and while going through the town, he noticed an inhabitant who seemed to be treated with marked respect by everyone. Upon asking the agent the reason, he received this reply:

"He is one of the early settlers."

"He can't be," replied Bald. "He is not 30 years of age."

"That may be true," said the agent, "but he pays all his bills promptly on the first of every month."

—*Mid-Continent Diamond*

* * *

Sweet Young Thing—"My grandfather is seventy years old and has never used glasses."

He—"That's nothing. Lots of folks prefer to drink out of bottles."

—*Pennico News*

* * *

Will He Lose Out on Orphan Annie?

"Doctor," he murmured. "What are my chances?"

"Not so bad, not so bad. But don't start reading any long continued stories!"

—*Bit and Tongs*

* * *

The Editor's Lament

Most anyone can be an editor. All the editor has got to do is to sit at a desk six days out of the week, four weeks of the month and twelve months of the year, and, "edit" such stuff as this:

"While J. H. Beals was escorting Miss Alma Johnson from the church social last Saturday night a savage dog attacked them and bit Mr. Beals several times on the public square."

—*Mid-Continent Diamond*

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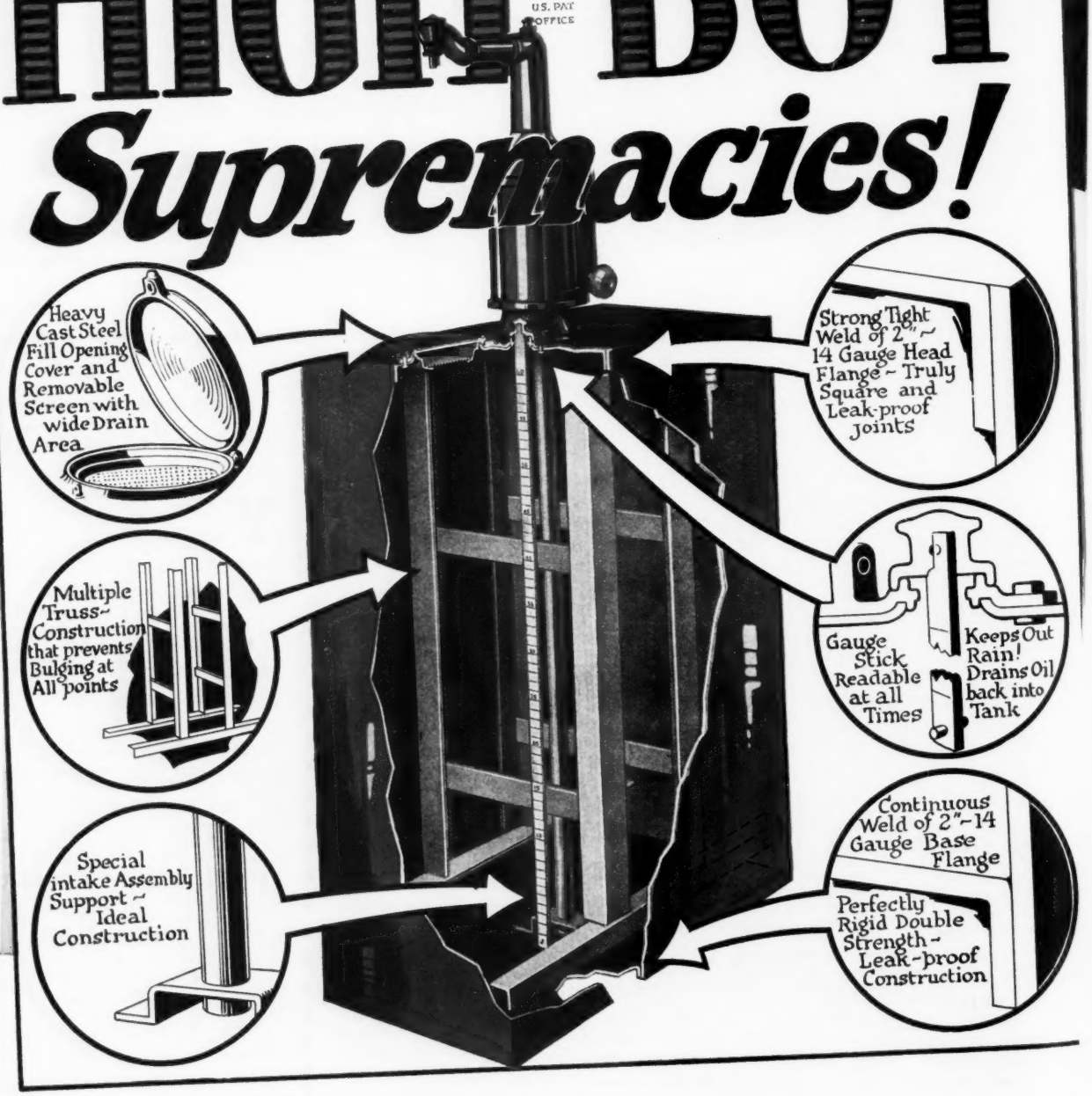
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Refinery - Tank Wagon Markets

National Petroleum News

Demand Holds Up for All Mid-Continent Products and Prices Vary Little

Staff Special
TULSA, Sept. 10

A COMPARATIVELY good demand for all refined products prevented more than minor price fluctuations in the Mid-Continent market this week. Natural gasolines prices today were down 0.25 to 0.50 cent as compared with prices a week ago.

That gasoline consumption over the Labor Day holiday was as good if not better than anticipated by jobbers, is evidenced by the spot sales reports to *PLATT'S OILGRAM* from a majority of Oklahoma refiners. Refiners that report spot sales, have 81.9 per cent of the operating capacity of the state. They reported 665 cars of 58-60 U. S. Motor gasoline were sold on the spot market in the Aug. 27-Sept. 2 week. Although a majority of refiners closed their offices at noon Sept. 3 not to reopen them until Sept. 6, spot sales for the Sept. 3-9 week totaled 483 cars, only 182 cars fewer than in the preceding week.

In the Aug. 27-Sept. 2 period the 124 Mid-Continent refiners that report operating statistics to this publication set a new peak for shipments and reduced stocks approximately 5,500,000 gallons.

Kansas refiners reported that their shipments the last week also were good. Two Louisiana refiners reported yesterday that they were completely sold up on U. S. Motor gasoline, and one of them had bought some goods from a third refiner in that district. Similar stories were obtained from Arkansas refiners, while north Texas refiners indicated their shipments were fair but prices were off fractionally.

REPORTS were heard in several quarters that crude runs had been curtailed by several refiners in the various districts of the Mid-Continent. One Kansas refiner is understood to have cut his runs from 12,000 barrels daily to 4,000 barrels. Three plants in Texas closed recently and another probably will close as soon as orders now on the books are filled.

Exporters were inactive this week in the Mid-Continent gasoline market. Domestic demand for the higher gravity gasolines, however, has been about normal for this season of the year.

Refiners who have built a good business in Canada for higher gravity gasolines report their orders have increased somewhat as Canadian jobbers prepare for the fall and winter business.

Natural gasoline buying has been considerably slower than in the corresponding period of August. Several manufacturers have been pressed for shipping instructions while others have been able to ride out the market without much difficulty.

The lower prices and buying lull were generally considered temporary, and indications were today that more active buying would be witnessed before the end of next week.

One buyer is inquiring for some grade AA movement east. He is seeking the goods in Texas since the rate from Texas points is considerably lower than from Oklahoma. His inquiries together with a few purchases he has made has given the Texas markets a little more strength than the Oklahoma markets.

ANOTHER company booked an order for grade AA for movement south, the price being 5.50 cents, shipment over the month. Still another company was understood to have received an increase in its contract shipments south, and several salesmanagers today were expecting these two companies to cover at least a part of the orders some time next week.

Doctor and corrosion test natural gasolines continued to bring slightly higher prices than sour goods. After Oct. 1, however, goods will have to be doctor test to meet specifications, the Association of Natural Gasoline Manufacturers having set that date as the time for the adoption of their revised specifications.

Kerosene buying was reported good in all districts again this week, although there was little if any export business transacted. While there were odd cars of 41-43 water white kerosene moved for resale at 4 cents, the bulk of business this week to the trade was at prices ranging from 4.125 to 4.25 cents, with odd cars even at 4.375 cents.

Cool weather two or three weeks ago caused some interest in stove distillates, but warmer weather since before Labor Day has shoved this commodity into the background for the time being.

A few refiners who are storing most of their distillates to care for winter demand, are quoting 3.50 cents on 38-40 straw goods. The spot market on ordinary 38-40 straw distillate, however, is around 3.125 cents, with low flash and cold test goods bringing 3.25 cents, and in a few instances 3.375 cents a gallon.

Inquiries for gas oil, especially in north Texas and north Louisiana, have been good the past week, several refiners reported. The activity in Texas can be traded at least indirectly to export inquiries, with the discovery that goods meeting export specifications were relatively scarce. Prices in Texas accordingly moved up slightly.

Buyers who had been getting 32-36 gas oil in Texas at 2.25 cents a gallon were forced to pay 2.375 to 2.50 cents, which due to freight differentials in certain northern points made the price practically the same as Group 3. More orders accordingly found their way to books of Oklahoma refiners.

Louisiana refiners are preparing for the winter demand on their 32-36 straw zero gas oil, and two or three are not quoting at present. Last winter the Louisiana refiners were able to get good prices on their gas oils, the buyers moving the goods in competition to 36-38 and 38-40 straw distillates.

FUEL oils have been steady in price again this week with the normal amount of business being transacted. North Texas prices moved slightly higher this week as a result of heavy industrial and railroad buying around Sept. 1. Three refiners were reported to have sold a quantity of fuel for over the month to one or two railroads at 82.5 cents a barrel. One

(*Continued on Page* 117)

ANTI-CARBON

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The Shell Refinery at East Chicago, Indiana

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

PENNSYLVANIA	Prices Sept. 12	Prices Sept. 6	Prices Aug. 29
52-54 Naphtha	8.25 – 8.50	8.25 – 8.50	8.50 – 8.75
54-56 Naphtha	8.50 – 8.625	8.25 – 8.75	8.50 – 9.00
58-60 Gasoline	8.25 – 8.50	8.25 – 8.50	8.50 – 8.75
60-62 Str.-run gasoline	8.75 – 9.25	8.75 – 9.25	9.00 – 9.50
64-66 Str.-run gasoline	9.50 –10.00	9.50 –10.25	9.50 –10.50
68-70 Str-run gas. 350-360 e.p.	10.00 –10.50	10.25 –10.75	10.25 –10.75
OKLAHOMA			
48-50 450 e.p. naphtha	6.00	6.00	6.00 – 6.25
50-52 450 e.p. naphtha	6.00	6.00	6.00 – 6.25
56-58 450 e.p. gasoline	6.00	5.75 – 6.25	6.00 – 6.50
58-60 450 e.p. gasoline	6.00	5.875– 6.25	6.00 – 6.50
56-58 U. S. Motor, 437 e.p.	*6.00	*6.00 – 6.25	*6.00 – 6.25
58-60 U. S. Motor, 437 e.p.	6.00 – 6.25	6.00 – 6.375	6.125– 6.375
60-62 437 e.p. gasoline	**6.125– 6.75	6.125– 6.75	6.25 – 6.75
60-62 400 e.p. gasoline	**6.25 – 7.00	**6.50 – 7.00	**6.50 – 7.00
64-66 390 e.p. gasoline	**6.50 – 7.00	**6.50 – 7.00	**6.75 – 7.25
64-66 375 e.p. gasoline	**6.75 – 7.25	**6.75 – 7.25	**6.75 – 7.25
68-70 350-360 e.p. gasoline	**7.00 – 7.50	**7.00 – 7.50	**7.25 – 7.50
KANSAS* (F. O. B. refinery Kansas destination)			
58-60 U. S. Motor 437 e.p.	6.25 – 6.375	6.25 – 6.50	6.25 – 6.75
60-62 400 e.p. gasoline	6.75 – 7.00	6.75 – 7.00	7.00
64-66 375 e.p. gasoline	7.25	7.25	7.25
NORTH TEXAS			
48-52 450 e.p. naphtha	†6.00	†6.00	†6.00
56-58 450 e.p. gasoline	5.75	5.75	5.875
58-60 450 e.p. gasoline	5.75	5.75	5.875
58-60 U. S. Motor 437 e.p.	6.00	6.00	6.00
60-62 400 e.p. gasoline	6.25	6.25	6.25 – 6.375
64-66 390 e.p. gasoline	6.375	6.375	6.50
64-66 375 e.p. gasoline	6.50 – 6.625	6.375– 6.625	6.625
68-70 350-360 e.p. gasoline	*7.00 – 7.25	*7.00 – 7.25	*7.00 – 7.25
NORTH LOUISIANA (For Louisiana and differential territory destination)			
56-58 U. S. Motor gasoline	6.25 – 6.50	6.25 – 6.50	6.25 – 6.50
ARKANSAS (For Arkansas intrastate shipment)			
56-58 450 e.p. gasoline	6.25	6.25	6.25
58-60 450 e.p. gasoline	6.25	6.25	6.25
58-60 U. S. Motor 437 e.p.	6.25 – 6.50	6.50	6.50 – 6.75
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
58-60 U. S. Motor 437 e.p.	**6.00 – 6.50	**6.25 – 6.50	**6.25 – 6.75
CALIFORNIA			
*54-58 U.S. Motor 437 e.p.	7.25 – 8.50	7.25 – 8.50	7.25 – 8.50
*58-61 U.S. Motor 437 e.p.	8.50 – 9.50	8.50 – 9.50	8.50 – 9.50
*42-45 Eng. dis. 445-480 e.p.	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00

*2c tax to be added if used in state.

NEW ENGLAND

"These prices have been discontinued in this table and will appear hereafter in the Seaboard market for Boston."

NATURAL GASOLINE

(Note: End point of all grades, not over 375° F.)

OKLAHOMA			
Grade AA, 80-87.9, 90% Recovery	5.50 – 5.875	5.75 – 6.00	6.00 – 6.25
Grade A, 72-79.9, 90% Recovery	5.50 – 5.875	5.75 – 6.00	6.00 – 6.25
Grade BB, 84-92, 85% Recovery	5.25 – 5.375	5.375– 5.50	5.50 – 5.75
Grade B, 76-83.9, 85% Recovery	5.25 – 5.375	5.375– 5.50	5.50 – 5.75
Grade C, 80-90, 78% Recovery	5.00 – 5.25	5.125– 5.375	5.375– 5.625
NORTH TEXAS (F. O. B. Breckenridge)			
Grade AA, 80-87.9, 90% Recovery	5.625– 5.75	5.75 – 6.00	6.00 – 6.25
Grade A, 72-79.9, 90% Recovery	5.625– 5.75	5.75 – 6.00	6.00 – 6.25
Grade BB, 84-92, 85% Recovery	5.25 – 5.375	5.375– 5.50	5.50 – 5.75
Grade B, 76-83.9, 85% Recovery	5.25 – 5.375	5.375– 5.50	5.50 – 5.75
Grade C, 80-90, 78% Recovery	5.00 – 5.25	5.125– 5.375	5.375– 5.625
NORTH LOUISIANA (F. O. B. Monroe District)			
Grade AA	†6.25	†6.25	†6.25
Grade BB	†6.00	†6.00	†6.00
Grade C	†6.00	†6.00	†6.00
CALIFORNIA			
75-85, 375-390 e.p. blend.	8.00 –10.00	8.00 –10.00	7.50 –10.00

MOTOR FUEL BLENDS

PENNSYLVANIA			
68-70 Blend 437 e.p.	Prices	.....	.....
64-66 Blend 437 e.p.	Temporarily	.....	.....
60-62 Blend 437 e.p.	discontinued	.....	.....
OKLAHOMA			
64-66 Blend 437 e.p	5.75 – 6.00	5.875– 6.25	6.00 – 6.25

BURNING OILS

PENNSYLVANIA			
45 w.w. kerosene	6.00 – 6.25	5.875– 6.00	5.75 – 6.00
46 w.w. kerosene	6.50	6.00 – 6.50	6.00 – 6.50
47 w.w. kerosene	7.00	6.50 – 7.00	6.50 – 7.00
OKLAHOMA			
41-43 w.w. kerosene	4.125– 4.25	4.125– 4.25	4.00 – 4.25
42-44 w.w. kerosene	4.625– 4.75	4.50	4.375– 4.50

	Prices Sept. 12	Prices Sept. 6	Prices Aug. 29
KANSAS (F. O. B. refinery Kansas destination)			
41-43 w.w. kerosene	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
42-44 w.w. kerosene	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
NORTH TEXAS			
40-42 w.w. kerosene	3.75	3.75	3.50 – 3.625
41-43 w.w. kerosene	4.00 – 4.125	4.00	3.75
NORTH LOUISIANA (For Louisiana and differential territory destination)			
41-43 w.w. kerosene	4.25 – 4.50	4.25 – 4.50	4.25
ARKANSAS (For intrastate shipment only)			
41-43 w.w. kerosene	.....	4.25	4.125
42-44 w.w. kerosene	4.50 – 4.75	4.50 – 4.75	4.50
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
41-43 w.w. kerosene	.....	4.125– 4.25	4.00 – 4.125
42-44 w.w. kerosene	4.50	4.50	4.25 – 4.375
CALIFORNIA			
38-40 w.w. kerosene	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50

NEW ENGLAND

"These prices have been discontinued in this table and will appear hereafter in the Seaboard market for Boston."

NEUTRAL OIL

PENNSYLVANIA Vis.	(Viscosity at 70°F.)		
200 No. 3 Assoc. Filt.	34.50 –35.50	34.50 –35.50	34.50 –35.00
180 No. 3 Assoc. Filt.	31.75 –32.50	31.75 –32.50	31.00 –32.00
150 No. 3 Assoc. Filt.	27.75 –28.50	27.75 –28.50	27.50 –28.50
	(Non Viscous)		
34 Grav. 330-340 Flash	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
36 Min. Neut. 300-305 Flash	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
****OKLAHOMA**			
Vis. Color	(Viscosity at 100°F.)		
100—No. 2	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
150—No. 3	8.25 – 8.50	8.25 – 8.50	8.50
150—No. 4	8.00 – 8.50	8.00 – 8.50	8.25 – 8.50
180—No. 3	9.50 –10.00	9.50 –10.00	9.00 –10.00
180—No. 4	9.50 – 9.75	9.50 – 9.75	9.75
180—No. 5	9.25 – 9.75	9.25 – 9.75	9.50 – 9.75
200—No. 3	9.50 –11.00	9.50 –11.00	9.50 –11.00
200—No. 4	9.50 –10.75	9.50 –10.75	10.50 –10.75
200—No. 5	8.50 –10.50	9.00 –10.50	9.00 –10.50
220—No. 3	12.50 –13.50	12.50 –13.50	12.50 –13.50
220—No. 4	12.25 –12.50	12.25 –12.50	12.25 –12.50
220—No. 5	11.50 –12.00	11.50 –12.00	11.50 –12.00
240—No. 3	14.00	14.00	14.00
240—No. 4	13.50	13.50	13.50
240—No. 5	12.00 –13.00	12.00 –13.00	12.00 –13.00
280—No. 3	16.00 –17.00	16.00 –17.00	16.00 –17.00
280—No. 4	15.25	15.25	15.25
280—No. 5	14.00 –15.00	14.00 –15.00	14.00 –15.00
300—No. 5-6	17.00	17.00	17.00
GULF COASTAL			
Vis. Color	(Viscosity at 100° F., pour test 0)		
100—No. 2 Unfilt. Pale	7.00 – 7.50	7.50 – 8.00	7.50 – 8.00
200—No. 3 Unfilt. Pale	9.25 –10.00	9.25 –10.00	9.25 –10.00
300—No. 3 Unfilt. Pale	10.50 –11.50	10.50 –11.50	10.50 –11.50
500—No. 3½ Unfilt. Pale	12.00 –13.00	12.00 –13.00	12.00 –13.00
750—No. 4 Unfilt. Pale	14.50 –15.50	14.50 –15.00	14.50 –15.00
200—No. 5½ Red Oil	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00
300—No. 5½ Red Oil	9.00 –10.00	9.00 –10.00	9.00 –10.00
500—No. 6 Red Oil	10.25 –11.25	10.25 –11.25	10.25 –11.25
750—No. 6 Red Oil	13.00 –14.00	13.00 –14.00	13.00 –14.00
CALIFORNIA			
Vis. Color	(Viscosity at 100°F.)		
100—No. 2	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
100—No. 3	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00
200—No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
300—No. 3	10.50 –11.00	10.50 –11.00	10.50 –11.00
450—No. 3-3½	13.00 –13.50	13.00 –13.50	13.00 –13.50
550—No. 3-3½	14.50 –15.00	14.50 –15.00	14.50 –15.00
600—No. 3-3½	15.00 –15.50	15.00 –15.50	15.00 –15.50
100—No. 5	6.50	6.50	6.50
200—No. 5	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
300—No. 5	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
400—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
500—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
600—No. 5	12.00 –12.50	12.00 –12.50	12.00 –12.50
700—No. 7	14.00 –14.50	14.00 –14.50	14.00 –14.50

CYLINDER STOCKS

****OKLAHOMA**			
190-200 Vis. at 210° Brt. St.	31.00 –32.00	31.00 –32.00	31.00 –32.00
150-160 Vis. at 210° Brt. St.	25.00 –27.00	25.00 –27.00	25.00 –27.00
600 E St. 140-150 Vis.-210°	17.00 –18.00	17.00 –18.00	17.00 –18.00
600 St. Ref. Olive Green	9.00 –10.00	9.00 –10.00	9.00 –10.00
600 St. Ref. Dark Green	7.00 – 8.00	7.00 – 8.00	7.00 – 8.00
Black Oil	5.00	5.00	5.00
PENNSYLVANIA	(1-inch Immersion Test)		
600 Steam Refined	9.50 –10.50	9.50 –10.25	9.00 –10.00
650 Steam Refined	12.00 –12.50	12.00 –12.50	11.50 –12.50
600 Flash	16.00 –17.00	16.00 –17.00	16.00 –17.00
625 Flash	27.00 –28.00	27.00 –28.00	26.00 –28.00
600 Warren E	18.00 –19.00	18.00 –19.00	18.50 –19.50
600 Oil City E	17.00 –17.50	17.00 –17.50	17.00 –18.00
600 D Filtered	25.50 –26.00	25.50 –26.00	25.00 –26.00
Cold Test Stocks (brt. filt.)	34.50 –35.50	35.00 –36.00	35.00 –35.50
Cold Test Stock (dark filt.)	33.00 –34.00	33.00 –34.00	33.00 –34.00

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher)

†PRICES NOMINAL ††ONLY ONE REFINER QUOTING *QUOTATIONS ONLY **REPRESENTS BOTH SALES AND QUOTATIONS

Patent Pending

MORE OIL SALES

With oil displayed in this Rack holding 24 Dispensers. Has hinged caps covering each spout. All Bottle trays removable. The Neatest and Best Rack on the market.

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Our goods protect you on past and future infringement interference.

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REPUTATION GUARANTEE SATISFACTION

On good roads or bad roads, loaded or light, Brown tanks will remain tight. No secret reinforcements nor mysterious highsounding features. Just good honest full weight material correctly built by real tradesmen. The Brown Certified Truck Tank is the result of practical oil men's experience. From the oil man's standpoint, we offer just what you expect—efficient service—oil-tight at all times—and attractive appearance—priced right. Get our figures and compare the facts.

A 1650 gallon with stake barrel carriers and underslung canboxes

BROWN SHEET IRON & STEEL CO. **ST. PAUL, MINN.**

Tear out this Coupon and mail it today

Make of Truck..... Size Tank Required.....

Other equipment on which you may send prices.....

Name..... Address.....

Refinery Markets on Wax and Heavy Oil Products

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(For quick reference to Refinery prices, get the OIL PRICE HANDBOOK, published annually)

WAX

PENNSYLVANIA Per Pound, New York	Prices Sept. 12	Prices Sept. 6	Prices Aug. 29
122-124 white crude scale.	3.125	3.00 – 3.125	3.00 – 3.125
124-126 white crude scale.	3.125	3.00 – 3.125	3.00 – 3.125
OKLAHOMA			
**124-126 White Crude Scale	2.75 – 3.00	2.625– 2.875	2.50 – 2.625
CALIFORNIA			
White crude scale, per pound	6.00 – 7.00	6.00 – 7.00	6.00 – 7.00

FUEL OIL

PENNSYLVANIA			
36-40 fuel oil	4.625– 4.75	4.625– 4.75	4.625– 4.75
30-34 fuel oil	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
28-32 fuel oil	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
OKLAHOMA			
38-40 straw distillate	3.125– 3.25	3.125 – 3.25	3.25
36-38 straw distillate	3.00	3.00	3.00
32-36 gas oil, cracked	2.50 – 2.625	2.50 – 2.625	2.50 – 2.625
32-36 gas oil, str. reduced	2.50 – 2.625	2.50 – 2.625	2.50 – 2.625
28-30 fuel oil (in bbls.)	$0.95 – 1.00	$0.95 –$1.00	$0.95 – 1.00
26-28 fuel oil (in bbls.)	0.90 – 0.95	$0.90 –$0.95	$0.90 – 0.95
24-26 fuel oil (in bbls.)	**$0.85 – 0.875	**$0.85–$0.875	**$0.85– 0.875
22-26 fuel oil (in bbls.)	**$0.825– 0.85	**$0.825–$0.85	**$0.825–0.85
18-22 fuel oil (in bbls.)	**$0.775– 0.825	**$0.775–$.825	**$0.775–0.825
16-18 fuel oil (in bbls.)	**$0.75 – 0.80	**$0.75–$0.80	**$0.75– 0.80
14-16 fuel oil (in bbls.)	**$0.75 – 0.80	**$0.75–$0.80	**$0.75– 0.80
KANSAS (F. O. B. refinery Kansas destination.)			
38-40 straw distillate	3.50 – 3.75	3.50 – 3.75	3.50 – 3.75
36-38 straw distillate	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
32-36 gas oil	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
24-26 fuel oil	*$0.95 – 1.05	*$0.95 –$1.05	†$0.95 – 1.05
18-22 fuel oil	*$0.85 – 0.90	*$0.85 –$0.90	†$0.85 – 0.90
NORTH TEXAS			
38-40 straw distillate	3.00	3.00	3.00
32-36 gas oil, cracked	2.50	2.25 – 2.375	2.25 – 2.50
32-36 gas oil, uncracked	2.50	2.25 – 2.375	2.25 – 2.50
24-26 fuel oil (in bbls.)	$0.80	0.775– 0.80	$0.80

GULF COASTAL	Prices Sept. 12	Prices Sept. 6	Prices Aug. 29
Fuel (in bbls.)	$1.60 –$1.65	$1.60 –$1.65	$1.60 –$1.65
Gas oil	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
NORTH LOUISIANA (For Louisiana and differential territory destination)			
32-36 gas oil, cracked	3.00 – 3.125	3.00	3.00
32-36 gas oil, uncracked	3.00 – 3.125	3.00	3.00
16-20 fuel oil (in bbls.)	$1.10 – 1.15	$1.10 –$1.15	$1.10 – 1.15
ARKANSAS (For Arkansas intrastate shipment only)			
32-36 gas oil, straw	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
28-32 gas oil	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25
Road oil	$1.25 – 1.30	$1.25 –$1.30	$1.25 – 1.30
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
28-32 gas oil	2.75 – 3.00	2.75 – 3.00	2.75 – 3.00
Smackover crude fuel	$1.10 – 1.15	$1.10 – 1.15	$1.10 – 1.15
Road oil	$1.15 – 1.25	$1.15 – 1.25	$1.15 – 1.25
CALIFORNIA (F. O. B. San Joaquin Valley. At San Francisco, 4c per bbl. more)			
14-18 fuel oil (in bbls.)	$0.65 –$0.90	$0.65 –$0.90	$0.65 –$0.90
14-18 Bunker oil (in bbls.)	$0.85 –$1.00	$0.85 –$1.00	$0.85 –$1.00
30-34 gas oil (in bbls.)	$0.90 –$1.00	$0.95 –$1.05	$0.95 –$1.05
27 Plus Diesel oil (in bbls.)	$0.85 –$1.00	$0.85 –$1.00	$0.90 –$1.00
NEW ENGLAND			

These prices have been discontinued in this table and will appear hereafter in the Seaboard market for Boston.

PETROLATUMS

PENNSYLVANIA (In cents per pound in tank cars; in barrels, in car lots ¾c per pound more.)			
Snow White	7.50 – 7.75	7.50 – 7.75	7.50 – 7.75
Lily White	6.50	6.50	6.50
Cream White	5.50	5.50	5.50
Light Amber	2.875– 3.00	2.875– 3.00	2.875– 3.00
Amber	2.625– 2.75	2.625– 2.75	2.625– 2.75
Red	2.375	2.375	2.375
Green No. 5 color	1.75	1.75	1.75

*PETROLEUM COKE

(Per ton in car lots)

Lump	$5	$5	$5
Still run	$3	$3	$3
Breeze	$2	$2	$2

† Prices Nominal. †† Only one refiner quoting. * Quotation only. ** Represents both sales and quotations.

(Continued from Page 113)

refiner is completely sold up and is quoting 85 cents a barrel. The spot price today, however, was around 80 cents a barrel.

Neutral oils and cylinder stocks were unchanged. Wax was 0.125 cent higher, with two or three refiners in Oklahoma reporting they were sold up for this month.

Meets Price Competition With Lower Grade Goods

CHICAGO, Sept. 10.—A method of combatting a local price war, not entirely new but still effective, is being used by the Cardinal Petroleum Co., Muskegon, Mich., which is up against a local war more than 18 months old and a gross margin of 2½ cents between tank car and service station.

Cardinal Petroleum Co. is meeting low prices with its "Common Gas" grade, and maintaining the normal schedule on its competitive grade. "Common Gas" is not recommended by the company, which says that it is as good as any cheap price gasoline in town and will make the car run. "Dixie Gas" is sold at the competitive grade price, and "Aviation" gasoline commands a 3 cent premium.

To resale agents the competitive grade is delivery at the existing tank wagon price, where necessary, but the dealer must sell at the normal service station price. If the dealer balks his pumps are taken out and relegated to the lot selling "Common Gas."

Jobbers who have used this method and have trained their station men well say it "works like a charm."

This method was used during a local price war some three years ago by C. H. Armould of Quincy, Ill.

Corrections to Last Week's Refinery Price Table

Prices of Oklahoma 58-60, 450 e. p. gasoline and California 550 vis. #3-3½ color neutral oil were published erroneously in the Sept. 6 column of prices in the refinery market tables of the Sept. 7 issue of NATIONAL PETROLEUM NEWS.

Price of 58-60, 450 e. p. gasoline should have been 5.875 to 6.25 cents, instead of 5.75 to 6.25 cents. Price of California 550 vis. 3-3½ neutral should have been 14.50 to 15 cents, instead of 14.50 to 15.50 cents.

Prices are corrected in the Sept. 6 column in the refinery market tables of this week's issue.

Gas Lift Enthusiasts Form Own Club

TULSA, Sept. 10.—As a result of a meeting of engineers and others interested in gas-lift and its problems, a club has been organized at Seminole for frequent meetings and discussion of the many phases of air and gas-lift work. All those actively engaged in gas-lift work in the Greater Seminole district have been invited to join the club, and a large attendance is looked for at the next meeting Sept. 14. Until further notice, the meetings will be held at the Walker Camp of the Indian Territory Illuminating Oil Co. in the Bowlegs field. H. B. Thomson, of the I. T. I. O. Co. has been elected acting secretary.

Eastern Kentucky Refinery Market

ASHLAND, Sept. 12.—Sales of all products are reported to have been larger in eastern Kentucky refining district and inventories have been reduced. Today's prices are:

60-62 400-425 endpoint gasoline	9.125
64-66 375-390 endpoint gasoline	9.375
68-70 325-350 endpoint gasoline	9.75
41-43 w.w. kerosene	6.00
34-36 gas oil	4.75
24-26 fuel oil	3.375
14-16 fuel oil	3.375

Kerosene Advanced at Chicago; Gasoline Buying Subsides

Staff Special
CHICAGO, Sept. 10

SOME sellers advanced their kerosene quotations on 41-43 w.w. grade 0.125 cent near close of business today. This grade sold at 4.25 cents Friday and Saturday, after moving at 4 to 4.25 cents Tuesday and Wednesday and at 4.125 to 4.25 cents Thursday. Small quantities were moving at 4.375 cents late this week. Jobber demand was good some sellers reported while others said their total sales were small.

U. S. Motor gasoline market was active at resumption of business Tuesday after the three-day holiday, settling down to routine run of orders by Friday. Chicago sellers had a good volume of rush orders on hand Tuesday and Wednesday. Excellent gallonage was reported over the week end in Standard Oil Co. of Indiana territory. The weather was fair in southern states, with rain in northern states, and temperatures were high. By Friday the Labor day buying flurry had subsided and business was on a hand-to-mouth basis. High test gasoline demand was unchanged, with one refiner continuing to report excellent business on the higher gravities.

Gasoline prices declined over the week. U. S. Motor was moving at 6.125 to 6.25 cents during the first two days, with a few 6 cent sales Thursday. Friday and Saturday bulk of movement was at 6 and 6.125 cents, with a sufficient volume of 6.25-cent sales to be a market factor. Oklahoma and differential territory goods comprised the 6-cent sales. One seller moved 28 cars U. S. Motor Friday at 6 cents, 10 cars from Oklahoma and the remainder from Louisiana and Arkansas. A jobber reported he received 6-cent quotations from refiners.

High test gasoline was down 0.125-cent. The 60-62, 437 e.p. grade moved at 6.375 cents Tuesday, at 6.25 to 6.375 cents Wednesday, and at 6.25 cents Thursday on; 60-62, 400 e.p. gasoline 6.50 to 6.75 cents until Thursday when the market was 6.375 to 6.625 cents; and 64-66, 375 e.p. closed at 6.75 to 7 cents after selling at 6.875 to 7 cents until Thursday.

Jobbers continued buying domestic heating oils for storage at current prices. Some sellers reported this business was mainly for small quantities while others said their jobbers were buying sizable quantities.

Industrial and gas plant grade of 32-36 gas oil sold at 2.50 to 2.625 cents. Dark zero oil, 32-36 gravity, price ranged from 2.625 to 2.875 cents, depending on flash with one seller offering 32-36 dark zero at 2.50 cents without flash specified. The 32-36 straw zero gas oil from Shreveport was selling at 3.125 cents, with other straw zero offered at 2.75 to 3 cents. The 38-40 straw distillate was 3.25 to 3.375 cents.

Fuel oil prices were steady. Demand was not heavy for the middle of the month, and sellers reported industrial demand fair. Jobbers were buying 28-30 fuel oil, with low cold test and flash specifications, at $1.025 and $1.05 a barrel. High cold test 28-30 fuel was $0.95 to $1.00. The 22-26 and 24-26 grades sold at $0.825 to $0.85 and 18-22 fuel at $0.80 to $0.825. Smackover quotation was $1.10 to $1.15.

Weather forecast for Standard of Indiana territory next week is for continued warm in southern part and variable temperatures mostly above seasonal normal in northern part; and cooler in all parts at end of week. Occasional shower periods are predicted for northern region.

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Week's Price Changes Tank Wagon Markets

Gasoline

Standard of Indiana—T.w. and s.s. prices gasoline reduced 2 cents, St. Joseph, to 14.5 cents and 16.5 cents respectively, including 2 cent state tax and 1 cent city tax, **Sept.** 7.

Standard of Kentucky—Gasoline road tax in Georgia was advanced ½ cent on **Sept. 1,** to 4 cents, and the ½ cent inspection fee was abolished at the same time. Hence, no changes in gasoline prices were made.

Standard of Louisiana—T.w. price only of gasoline reduced 1 cent, New Orleans, to 14.5 cents, **Aug. 23.** S.s. price only of gasoline advanced 1½ cents, Lake Charles, to 18.5 cents, **Sept. 1.** T.w. price only of gasoline advanced 1½ cents, Lake Charles, to 15.5 cents, **Sept. 2.**

Magnolia Petroleum—S.s. price only of gasoline advanced 3 cents, Fort Smith, to 18c, including tax, **Sept. 8.** S.s. price only of gasoline reduced 3 cents, to 18 cents, Little Rock, **Sept. 1,** while t.w. price remained unchanged at 18 cents, including 5 cent state tax. T.w. price only reduced 2 cents, Little Rock, to 16 cents, **Sept. 6.**

* * *

Kerosene

Standard of Kentucky—State tax of 1 cent on kerosene went into effect in Georgia on **Sept. 1.** Inspection fee of ½ cent was abolished at that time, and kerosene prices were raised ½ cent, to cover the difference between the old ½ cent inspection fee and the new 1 cent state tax.

Standard of Louisiana—Kerosene advanced 1½ cents, Lake Charles, to 14 cents t.w., **Sept. 2.**

Prairie August Shipments Down 1,312 Barrels

TULSA, Sept. 7.—Shipments of the Prairie Pipe Line Co. in August were 5,786,822 barrels, a decrease of 1,312 barrels as compared with July, but still higher than they have ever been since 1922. This was the sixth consecutive month in which these shipments have been more than 5 million barrels. Daily average in August was 186,672 barrels, as compared with 186,714 barrels in July.

Prairie shipments for the past six months have been as follows:

Month	Shipments	Daily Average
March	5,449,688	175,796
April	5,484,826	182,827
May	5,641,514	181,984
June	5,505,552	183,518
July	5,788,134	186,714
August	5,786,822	186,672

Tank Wagon, Service Station Markets for Gasoline and Kerosene In United States Territories and Canada

(OIL PRICE HANDBOOK has t.w. and s.s. markets for whole year arranged for quick reference)

These Prices In Effect September 12, 1927

S. O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Atlantic City, N. J.	16	2	18	20	14
Newark, N. J.	16	2	18	20	14
Annapolis, Md.	16	4	20	23	12
Baltimore, Md.	16	4	20	23	10
Cumberland, Md.	16	4	20	23	14
Washington, D. C.	16	2	18	21	12
Danville, Va.	16	4½	20.5	*	14
Norfolk, Va.	16	4½	20.5	23.5	12
Richmond	14	4½	18.5	21.5	14
Roanoke, Va.	16	4½	20.5	23.5	14
Petersburg, Va.	16	4½	20.5	23.5	14
Williamsburg, Va.	16	4½	20.5	23.5	14
Charleston, W. Va.	16	4	20	23	14
Clarksburg, W. Va.	16	4	20	21	14
Keyser, W. Va.	16	4	20	*	14
Parkersburg, W. Va.	13	4	17	20	14
Wheeling, W. Va.	16	4	20	23	14
Charlotte, N. C.	16	4	20	23	14
Hickory, N. C.	16	4	20	23	14
High Point, N. C.	16	4	20	20	14
Mt. Airy, N. C.	16	4	20	23	14
Salisbury, N. C.	16	4	20	23	14
Charleston, S. C.	15	5	20	23	14
Columbia, S. C.	15	5	20	23	14

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

*New York City	17	0	17	21	15
Albany, N. Y.	17	0	17	19	15
Buffalo, N. Y.	15	0	15	18	14
†Rochester, N. Y.	13	0	13	16	13
Syracuse, N. Y.	17	0	17	19	15
Boston, Mass.	17	0	17	18	15
Augusta, Me.	17	3	20	22	15
Manchester, N. H.	17	2	19	21	15
Burlington, Vt.	17	3	20	22	15

*In steel barrels.

†It is reported that S. O. New York is selling a second grade of gasoline at Rochester, 4c below the above posted prices which apply on its Socony grade.

ATLANTIC REFINING

Pittsburgh, Pa.	16	*	16	*22	14
Philadelphia, Pa.	15	*	15	*21	14
Allentown, Pa.	16	*	16	*22	14
Erie, Pa.	12	*	12	*18	14
Scranton, Pa.	16	*	16	*22	14
Altoona, Pa.	16	*	16	*22	14
Dover, Del.	16	3	19	22	14
Wilmington, Del.	16	3	19	22	14
Providence, R. I.	17	2	19	19	15
Boston, Mass.	17	0	17	17	15
Springfield, Mass.	17	0	17	17	15
Worcester, Mass.	17	0	17	17	15
Hartford, Conn.	19	2	21	22	15
New Haven, Conn.	19	2	21	21	15

*3-cent state tax is collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Lexington, Ky.	13	5	18	21	15.5
Louisville, Ky.	14	5	19	22	15
Covington, Ky.	14	5	19	22	15.5
Clarksdale, Miss.	13	4	17	20	12.5
Gulfport, Miss.	††14.5	4	††18.5	21.5	14
Jackson, Miss.	13	4	17	20	13.5
Natchez, Miss.	12.5	4	16.5	19.5	14
Vicksburg, Miss.	12.5	4	16.5	19.5	14
Birmingham, Ala.	14	4	18	21	15.5
Mobile, Ala.	13	4	17	20	15
Montgomery, Ala.*	15	4	19	22	16.5
Atlanta, Ga.	12	4	16	18	†15.5
Augusta, Ga.	15	4	19	22	†16.5
Macon, Ga.	15	4	19	22	†16.5
Savannah, Ga.	12	4	16	18	†14.5
Jacksonville, Fla.°	10	5	15	18	14
Miami, Fla.°	12	5	17	20	15.5
Tampa, Fla.°	9	5	14	17	14
Pensacola°	**11	5	**16	19	15

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia kerosene prices include 1c state tax.

°Florida gasoline prices include ½c inspection fee.

**Both tank wagon prices include 1c city tax at Pensacola, which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

S. O. INDIANA

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Chicago, Ill.	14	2	16	18	12
Decatur, Ill.	14.2	2	16.2	18.2	12.1
E. St. Louis, Ill.	13.1	2	15.1	17.35	11.2
Joliet, Ill.	14.4	2	16.4	18.4	12.3
Peoria, Ill.	10	2	12	12	12.1
Quincy, Ill.	14.2	2	16.2	18.2	11.9
Indianapolis, Ind.	14.2	3	17.2	19.2	13.2
Evansville, Ind.	14	3	17	19	13
South Bend, Ind.	14.4	3	17.4	19.4	13.4
Detroit, Mich.	14.8	3	17.8	19.8	13.7
Grand Rapids, Mich.	14.7	3	17.7	19.7	13.6
Saginaw, Mich.	14.9	3	17.9	19.9	13.8
Green Bay, Wis.	14.6	2	16.6	18.6	12.4
Madison, Wis.	14.3	2	16.3	18.3	12.1
Milwaukee, Wis.	14.1	2	16.1	18.1	11.9
La Crosse, Wis.	15.2	2	17.2	19.2	13
Minneapolis, Minn.	12	2	14	14	12.9
Duluth, Minn.	13.5	2	15.5	17.5	12.9
Mankato, Minn.	15.1	2	17.1	19.1	12.7
Des Moines, Iowa	14	3	17	19	12.3
Davenport, Iowa	14.5	3	17.5	19.5	12.3
Sioux City, Iowa	14.1	3	17.1	19.1	11.9
Mason City, Ia.	14.5	3	17.5	19.5	12.3
St. Louis, Mo.	*13.6	2	15.6	17.9	11.3
Kansas City, Mo.	†12.9	2	14.9	16.9	10.6
St. Joseph, Mo.	†12.5	2	14.5	16.5	11.2
Fargo, N. D.	15	2	17	19	14.9
Grand Forks, N. D.	17.2	2	19.2	21.2	15.2
Minot, N. D.	16.9	2	18.9	20.9	14.9
Pierre, S. D.	15.5	4	19.5	21.5	13.9
Huron, S. D.	12.5	4	16.5	18.5	13.9
Wichita, Kans.	12.8	2	14.8	16.8	10.8
Bartlesville, Okla.	12.8	3	15.8	17.8	10.8

S. O. Indiana Q. D. A. schedule on tank wagon deliveries of gasoline, effective March 3 thru territory, except Wisconsin effective March 4: 50 gals. and over on delivery. 1c discount, except in city of Chicago where 1c discount applies on 100 gals. and over; 6,000 gals. and over per month, 1½c; 10,000 gals. and over per month, 2c; 15,000 gals. and over per month, 3c, except latter discount does not apply in Chicago.

Service station discounts: 200 gals. or more per month, and 2400 gals. or more per year, 2c per gal.

March 1, 1c discount on kerosene in 50 gal. dumps thru territory.

*Includes city tax of ½c.

†Includes city tax of 1c.

S. O. NEBRASKA

Omaha, Neb.	14.25	2	16.25	16.25	12.25
McCook	12.75	2	14.75	16.75	11.50
Norfolk	14.75	2	16.75	18.75	12.75
North Platte	15.75	2	17.75	19.75	13.50
Scottsbluff	15.25	2	17.25	19.25	13.00

CONTINENTAL OIL

Denver, Colo.	15	3	18	20	12.5
Pueblo, Colo.	15	3	18	20	14.5
Grand Junction, Colo.	18.5	3	21.5	23.5	18
Casper, Wyo.	15	3	18	20	13
Cheyenne, Wyo.	16	3	19	21	14.5
Butte, Mont.	19	3	22	22	19
Helena, Mont.	19.5	3	22.5	24.5	19
Salt Lake City, Utah	17.5	3½	21	23	17
Boise, Ida.	19.5	4	23.5	25.5	19
Twin Falls, Ida.	19.5	4	23.5	25.5	19
Albuquerque, N. M.	16	5	21	24	17

S. O. CALIFORNIA

Phoenix, Ariz.	19	3	22	26	21.5
Los Angeles, Cal.	13.5	3	16.5	20.5	15.5
Fresno, Cal.	14	3	17	21	16.5
San Francisco, Cal.	14	3	17	21	15.5
Reno, Nev.	18	4	22	26	19
Portland, Ore.	14.5	3	17.5	21.5	16.5
Seattle, Wash.	14.5	2	16.5	20.5	16.5
Spokane, Wash.	18.5	2	20.5	24.5	20.5
Tacoma, Wash.	14.5	2	16.5	20.5	16.5

S. O. LOUISIANA

Little Rock, Ark.	13	5	18	21	12
Alexandria, La.	13	2	15	18	†14
Baton Rouge, La.	12	2	14	17	†12.5
Lake Charles, La.	13.5	2	15.5	18.5	†14
New Orleans, La.	*12.5	2	*14.5	*18.5	*14
Shreveport, La.	13.5	2	15.5	18.5	†13
Lafayette, La.	13	2	15	18	†13.5
Bristol, Tenn.	16	3	19	22	14
Chattanooga, Tenn.	16.5	3	19.5	22.5	15
Knoxville, Tenn.	16.5	3	19.5	22.5	15
Nashville, Tenn.	15	3	18	21	15
Memphis, Tenn.	12	3	15	18	14

*New Orleans gasoline prices include 1c parish tax in addition to 2c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana include 1c state tax.

S. O. OHIO

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
All Ohio points	16	3	19	21	14

MAGNOLIA PETROLEUM

Muskogee, Okla.	12	3	15	18	9
Oklahoma City	12	3	15	18	9
Tulsa, Okla.	12	3	15	18	9
Fort Smith, Ark.*	11	*3	14	18	12
Little Rock, Ark.	11	5	16	18	12
Texarkana, Ark.*	12	*3	15	18	12
Dallas, Tex.	14	3	17	17	11
Fort Worth, Tex.	13	3	16	16	10
Houston, Tex.	14	3	17	17	15
San Antonio, Tex.	13	3	16	16	11
El Paso, Tex.	15	3	18	18	16

*Within City of Texarkana and Fort Smith, the state tax on gasoline is 3c per gal. conforming with the Texas state tax. In these two districts outside of the city the 5c Arkansas tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M. & P. Naphtha	Cleaner Naphtha
Chicago	16	18	18
Detroit	17.7	19.7	19.7
Kansas City	16.2	†18.2	†18.2
Milwaukee	16.7	*20.7	*20.7
Minneapolis	*20	*22	*22
St. Louis	15.9	17.9	17.9
New York	..	19	

*Includes 2c state tax.

†Includes 1c city tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Toronto	19.5	3	22.5	26	21
Ottawa	19.5	3	22.5	26	21
Cochrane	24.5	3	27.5	36	26
Ft. William	24.5	3	27.5	31	23.5

MANITOBA

Winnipeg	24.5	3	27.5	31	23.5

SASKATCHEWAN

Regina	27.5	0	27.5	32	26.5

ALBERTA

Edmonton	26.5	3	29.5	33	25.5
Calgary	24.5	3	27.5	31	23.5

BRITISH COLUMBIA

Vancouver	21	3	24	27	22

QUEBEC

Montreal	20.5	3	23.5	27	21
Quebec City	22.5	3	25.5	31	23
Three Rivers	22.5	3	25.5	30	23

NEW BRUNSWICK

St. John	24.5	3	27.5	32	24
Moncton	24.5	3	27.5	32	24

NOVA SCOTIA

Halifax	24.5	3	27.5	32	24
Sydney	26.5	3	29.5	34	26

PRINCE EDWARD ISLAND

Charlottetown	24.5	3	27.5	31	24

Note: In districts surrounding these points 1c additional is added to city price.

Gasoline Prices Recede Slightly In Quieter Gulf Markets

Staff Special
NEW YORK, Sept. 10.

SLIGHT recession in gasoline prices was evidenced in the Gulf export market this week. Fewer foreign buyers were in the market than in any of the last two or three weeks. Opinion was general today that list prices next week would doubtless show a further decline.

Foreign buyers continued to show considerable interest in the market but their reluctance to pay prices asked for gasolines prevented any appreciable amount of activity from developing.

The specific inquiries in the market were comparatively few but those which were circulated among exporters were closed at prices generally 0.25 cent under the list prices for gasolines of the majority of refiners.

A Spanish buyer entered the market around the middle of the week for two mixed cargoes totaling approximately 30,000 barrels each. The business was closed by a leading refiner with 61-63, 390 end point gasoline selling at 7.75 cents, and prime white and water white kerosene selling at 5 cents and 6 cents, respectively.

A Scandinavian buyer also purchased a 70,000-barrel cargo of 61-63, 390 end point and 64-66, 375 end point gasolines and prime white kerosene at 7.75 cents, 8.25 cents and 5 cents, respectively, for November-December shipment from the Gulf. The business was taken on for the account of a leading broker. Several refiners refused to quote on deferred shipment business stating that they feel prices will be appreciably higher toward the end of the year.

A wide range of quotations was reported for U. S. Motor gasoline. One or two refiners adhered strictly to their list price of 7.50 cents for this grade, whereas others reported that there was every reason to believe that as low as 7 cents could be done on firm offer. However, with no inquiries in the market for this grade, and subsequently no transactions closed, it might be said that 7.25 cents was the average asking price of the majority of sellers.

No separate kerosene transactions were reported closed this week. Prices were generally unchanged. The 44 water white kerosene held at 6 cents, and the 41-43 prime white goods at 5 cents, which have been the ruling prices for several months past.

A Scandinavian buyer was inquiring this week for a 50,000 barrel cargo of 26-28 translucent gas oil for late October shipment. A United Kingdom buyer was also inquiring for approximately 40,000 barrels of gas oil for December-January shipment. A leading broker who was negotiating the latter deal, reported 4.25 cents was the best price he could get for gas oil shipment as distant in the future as this. Spot prices were 3.875 cents for 26-28 translucent gas oil, and 4 cents for 30-32 translucent goods.

Prices of cased goods were generally unchanged and but few small orders were reported received this week. U. S. Motor gasoline in cases was generally quoted at $1.60 to $1.65 and 64-66, 375 end point gasoline in cases at $1.70 to $1.80. Water white kerosene in cases was largely held at $1.55 and prime white at $1.45.

The heavy oil market at the Gulf was quiet and generally unchanged. Grade C bunker oil was reported available at $1.25 a barrel in cargo lots but the majority of refiners were holding for $1.30. For bunkering Grade C was quoted at $1.40 a barrel, New Orleans, and $1.45 a barrel further west on the Gulf coast.

White crude scale wax was 3 cents a pound at the Gulf and fully refined goods was generally quoted at 4 cents a pound. Demand eased off considerably this week but a fair demand for small lots was reported by several dealers.

Jobber Buying Lags After Peak Gasoline Demand is Reached

Staff Special
NEW YORK, Sept. 10

GASOLINE consumption along the Atlantic seaboard soared to new heights over the Labor Day holiday, setting a record for holiday or week end consumption for this summer and greatly exceeding all expectations of the trade.

Virtually the entire east coast experienced three days of ideal motoring weather and subsequently many a motorist took the 400 or 500-mile jaunt that he had been planning all summer.

THE great exodus of people from New York City last Friday and Saturday was doubtless representative of the migration from every large city along the east coast for the three-day holiday. New York newspapers estimated that something like 2,000,000 persons left the city by rail Friday and Saturday and that almost an equal number left by automobile.

Jobbers this week were slow to react to the reduction in their gasoline stocks which the holiday doubtless caused. Gasoline demand was somewhat disappointing to the trade in New York at the beginning of the week. It was generally felt that buying this week would be much freer, and refiners thereby would be able to reduce their own stocks which are large at present.

The gasoline market was quiet Tuesday with virtually all sellers adhering strictly to their price schedules of 8.25 cents for U. S. Motor gasoline. One seller said business was slow for him at 8.25 cents and that any amount of business was available for him when he could quote 8 cents. He reported he had lost several large orders because he was unwilling to meet 8-cent competition.

Persistent reports were heard during the last few days of the week that U. S. Motor gasoline was being offered to the jobbing trade at 8 cent a gallon. In one or two instances, a small lot of goods was found sold at this price, but by far the majority of sellers quoted 8.25 cents for this grade and reported receiving a fair volume of business daily at this figure.

Sellers in the vicinity of Philadelphia generally held their quotations for U. S. Motor gasoline at 8.25 cents to the trade and the one refiner who was quoting on the California grade, reported he took business at the same price. Prices at Baltimore and Boston showed no change over the previous week. Refiners in the latter vicinity generally held for 8.50 cents, f.o.b. refinery or seaboard terminal.

Kerosene prices failed to react to the better market reported in other refining centers of the country. Prices at most seaboard points were unchanged, except at Boston where 41-43 prime white goods was quoted at 6.50 cents as against 6.75 cents the week before. Refiners predicted the decline in the kerosene market was but temporary and that with fall demand would doubtless cause an advance in the next few days.

AT NEW YORK, the 41-43 prime white kerosene was generally quoted at 6.25 to 6.50 cents with 43-45 water white goods largely held at 6.50 to 6.75 cents.

Burning oil prices were generally unchanged. Grade C bunker oil was firm at $1.65 a barrel and diesel oil was held at $2.10 a barrel in most quarters.

Complete Seaboard Market

(Export markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the years 1924-1925-1926)

Eastern Domestic Markets

(Prices in bulk except where otherwise noted f.o.b. refinery or seaboard plant)

	Sept. 12	Sept. 6
U. S. Motor gasoline, tank cars, New York Harbor	8.25	8.25
U. S. Motor gasoline, tank cars, Philadelphia	8.25	8.25
U. S. Motor gasoline, tank cars, Baltimore	8.25 – 8.50	8.25 – 8.50
U. S. Motor gasoline, tank cars, Boston	8.50 – 8.75	8.50
California U. S. Motor gasoline, tank cars, Philadelphia	8.25	8.25
California U. S. Motor gasoline, tank cars, Baltimore	8.25 – 8.75	8.25 – 8.75
41-43 p.w. kerosene, New York	6.25 – 6.50	6.25 – 6.50
43-45 w.w. kerosene, Philadelphia	6.50	6.50
41-43 w. w. kerosene, Boston	6.50	6.50
28-34 gas oil, New York	5.00	5.00
28-34 gas oil, Boston	5.25	5.00 – 5.25
38-42 furnace oil, New York	6.00	6.00
36-40 Furnace Oil, Boston	6.25 – 6.50	6.25 – 6.50
Grade C bunker oil, New York	$1.65	$1.65
Grade C bunker oil, Boston	$1.70	$1.70
Diesel oil, New York	$2.10	$2.10

New York Export Market

(Gasoline and kerosene in cases in bulk. Lubricating oils are all Penna. products, prices per gal. in bbls.)

	Sept. 12	Sept. 6
U. S. Motor gasoline	24.40	24.40
43-45, 150 w.w. kerosene	17.15	17.15
42-44, 110 s.w. kerosene	16.15	16.15
CYLINDER OILS		
Bright stock, dark	40.00 –41.00	40.00 –41.00
Filtered D 600	31.00 –32.00	31.00 –32.00
Filtered E 600 Warren	25.00 –26.00	25.00 –26.00
Unfiltered 600 s.r.	16.00 –18.00	16.50 –17.00
Unfiltered 650 s.r.	19.00 –20.00	19.50 –20.00
600 Flash s.r.	23.00 –24.00	23.00 –23.50
630 Flash s.r.	33.00 –34.00	33.00 –34.00
RED ENGINE OILS (Vis. 100°)		
300 vis. No. 6½ color	20.00	20.00
250 vis. No. 6 color	19.00	19.00
200 vis. No. 6 color	18.50	18.50
PALE ENGINE OILS (Vis. 100°)		
230 vis. No. 3¾ color	24.00	24.00
180 vis. No. 3¼ color	20.00	20.00
100 vis. No. 2¼ color	15.75	15.75
MOTOR OILS (Vis. 100°)		
600 vis. No. 7 color	35.00	35.00
500 vis. No. 7½ color	33.00	33.00
400 vis. No. 7¼ color	31.00	31.00
300 vis. No. 6 color	30.00	30.00
200 vis. No. 3¼ color	24.00	24.00
WAXES (Pa. stocks; in cents per pound, f.a.s. carload lots)		
WHITE CRUDE SCALE (In barrels)		
122-124 A.m.p.	3.00 – 3.25	3.00 – 3.125
124-126 A.m.p.	3.00 – 3.25	3.00 – 3.125
FULLY REFINED (In burlap bags)		
123-125 A.m.p. Philadelphia	4.25	4.125– 4.25
125-127 A.m.p.	4.25	4.125– 4.25
128-130 A.m.p.	4.25 – 4.375	4.25 – 4.375
130-132 A.m.p.	4.50 – 4.625	4.50 – 4.625
133-135 A.m.p.	*5.75	*5.75
135-137 A.m.p.	*6.00	*6.00
YELLOW CRUDE SCALE		
124-126 A.m.p.	2.875– 3.00	2.875– 3.00

* Prices Nominal

Gulf Export Market

(F.o.b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. and over, except where otherwise noted.)

	Sept. 12	Sept. 6
GASOLINE		
U. S. Motor	7.25	7.25 – 7.50
61-63, 390 e.p.	7.75	7.875– 8.00
64-66, 375 e.p.	8.25	8.25 – 8.50
U. S. Motor, cases (cargo lots)	$1.60 –$1.65	$1.60 –$1.65
64-66, cases (cargo lots)	$1.70 –$1.80	$1.70 –$1.80
KEROSENE		
44 water white	6.00	6.00
41-43 prime white	5.00	5.00
Water white, cases (cargo lots)	$1.55	$1.55
Prime white, cases (cargo lots)	$1.45	$1.45
DOMESTIC GAS AND BUNKER OILS		
*26-28 gravity	3.875	3.875
*30-32 gas oil	4.00	4.00
Grade C bunker oil	$1.40 –$1.45	$1.40 –$1.45
Grade C bunker oil, cargoes	$1.25 –$1.30	$1.25 –$1.30

*Translucent thru neck of 4 oz. bottle.

MEXICAN CRUDE AND BUNKER OILS (F.o.b. steamer, Tampico)		
Heavy Panuco crude taxes to be paid	$1.12	$1.12
Grade C bunker oil, for bunkering purposes, taxes paid	$1.50	$1.50
SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F; cold test 0) (Tanker, f.o.b. Houston)		
100 vis. No. 2 unfiltered pale	6.00 – 6.25	6.00
200 vis. No. 3 unfiltered pale	8.50 – 9.00	9.00
300 vis. No. 3 unfiltered pale	9.50 –10.00	9.50
500 vis. No. 3½ unfiltered pale	11.00 –12.00	11.00 –11.50
200 vis. No. 5½ red oil	11.00 –12.00	7.00 – 8.00
300 vis. No. 5½ red oil	8.00 – 9.00	8.00 – 9.00
500 vis. No. 6 red oil	10.00 –10.50	10.00 –10.50

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Sept. 12	Sept. 12
Gasoline, U. S. Motor, 53-55 Gravity	6.00 – 7.00	6.00 – 7.00
Gasoline, U. S. Motor, blends and special cuts	7.00 – 8.00	7.00 – 8.00
Gas Oil, 30-34, in bbls.	$0.90 –$1.00	$.095 –$1.05
Diesel Oil, 27 plus, in bbls.	$0.80 –$1.00	$0.95 –$1.05
Bunker Oil, 14-18, in bbls.	$0.85 –$1.00	$0.85 –$1.00
Fuel Oil, 14-18, in bbls.	$0.80 –$0.90	$0.80 –$0.90
Kerosene, 38-40 w.w., 125-150 flash, in gals.	4.50 – 5.00	4.50 – 5.00
Cased Goods		
Gasoline, U. S. Motor	$1.75 –$1.80	$1.75 –$1.80
Kerosene, 38-40, w.w., 125-150 flash	$1.40 –$1.50	$1.40 –$1.50

600 Steam Refined Oil Higher in New York

Staff Special

NEW YORK, Sept. 10.—An appreciable increase in demand for small lots of Pennsylvania 600 steam refined cylinder oil from foreign buyers was noted this week, and prices for this oil were advanced by most sellers approximately 1 cent a gallon. One buyer, however, reported he was able still to buy this oil at 16 cents a gallon. An accumulation of small orders and demand for this oil in the manufacture of bright stocks, have brought about a comparative scarcity of this grade in the New York market.

Other cylinder oils were generally unchanged in price. Some distress 600 flash and 630 flash were quoted at 21.5 cents and 32 cents a gallon, respectively, but the majority of sellers was holding for prices which averaged 23 to 24 cents for the former oil and 33 to 34 cents for the latter oil.

A slight improvement in domestic demand for white crude scale was reported to be bolstering prices for wax. The fact that three of the largest wax buyers in the United Kingdom have announced they are out of the market until after Jan. 1, however, is regarded with considerable consternation by some of the trade in New York.

White crude scale was largely quoted at 3 to 3.25 cents a pound, New York, and one refiner reported sales of approximately 600 tons at 3 cents this week. Fully refined grades were generally quoted 0.125 cent higher this week and those with high melting point continued comparatively scarce with prices largely nominal.

Press Sale of Special Gulf Lubes

HOUSTON, Sept. 10.—Refiners that manufacture special grades of Gulf Coastal lubricants, are pressing their sales on a quality basis and, in many cases, converting jobbers to these grades. Normal grades of unfiltered pales and red oils have shown little change in the last few weeks either as to price or demand. Some inquiries for bulk lubricants in small cargo quantities have been made but no sizable volumes have been sold for foreign movement.

WARREN, Pa.—Conewango Refining Co. is rebuilding its boiler house.

Crude Oil Prices, as Posted by Major

(Crude prices for years 1924-1925-1926 in

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$2.65
Bradford District Oil in National Transit Lines (Bradford District)	2.65
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	2.55
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	2.55
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	2.50
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)	2.25
Keister Grade in National Transit Lines (Butler Co.)	1.10
Cabell Grade in Eureka Pipe Lines (West Virginia)	1.40
Corning Grade in Buckeye Pipe Lines (Ohio)	1.45
Corning, O. heavy grade	1.35
*Somerset Oil in Cumberland Pipe Lines (Kentucky)	1.50
Ragland Grade in Cumberland Pipe Lines (Kentucky)	.95

*Somerset oil run prior to Oct. 1922, takes price of 6 cents lower than above quotations.

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines $1.50

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Effective March 14, 1927

Wooster	$1.57	Plymouth	$1.33
Lima	1.71	West. Kentucky	1.33
Waterloo	1.35	*Canadian Petro.	2.11
Indiana	1.48	*Oil Springs	2.18
Princeton	1.60	*Posted by Imperial Oil Ltd.	
Illinois	1.60		

OKLAHOMA, KANSAS And NORTH TEXAS

Prices of Prairie Oil & Gas Co.

(In Oklahoma, Kansas, North and East Central Texas)

Effective March 12, 1927

28-28.9	$1.12	35-35.9	$1.26
29-29.9	1.14	36-36.9	1.28
30-30.9	1.16	37-37.9	1.30
31-31.9	1.18	38-38.9	1.32
32-32.9	1.20	39-39.9	1.34
33-33.9	1.22	40-40.9	1.36
34-34.9	1.24	41-41.9	1.38
42-42.9	$1.40	48-48.9	$1.52
43-43.9	1.42	49-49.9	1.54
44-44.9	1.44	50-50.9	1.56
45-45.9	1.46	51-51.9	1.58
46-46.9	1.48	52 and above	1.60
47-47.9	1.50		

Above schedule met on March 12, by Gulf, Mid-Continent Pet. Corp., and Empire; by Carter, Humble and the Texas Co. on March 14.

Humble Oil & Refining Co. Prices
(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran and Nocona crudes all in Texas.)

March 14, same schedule as Praire in above fields.

Effective Sept. 1, Humble's gravity and price schedule on Lytton Springs crude is same as Magnolia Petroleum Co.'s May 5 schedule on Mid-Continent and North Texas crude as published below.

Mirando, Tex. $1.00

Magnolia Petroleum Co.
(In Oklahoma, Kansas and North and East Central Texas)

Effective May 5

Below 33	$1.05	43-43.9	$1.27
33-33.9	1.07	44-44.9	1.29
34-34.9	1.09	45-45.9	1.31
35-35.9	1.11	46-46.9	1.33
36-36.9	1.13	47-47.9	1.35
37-37.9	1.15	48-48.9	1.37
38-38.9	1.17	49-49.9	1.39
39-39.9	1.19	50-50.9	1.41
40-40.9	1.21	51-51.9	1.43
41-41.9	1.23	52 and above	1.45
42-42.9	1.25		
Corsicana heavy			$1.00

Carter Oil Co.
(Oklahoma and Kansas)

March 14, same schedule as Prairie.

PANHANDLE, TEXAS

Humble Oil & Refining Co.

Effective Aug. 23

Hutchinson, Carson and Wheeler Counties .. $0.75

Gray County, Effective March 14:

28-28.9	$ .80	37-37.9	$ .98
29-29.9	.82	38-38.9	1.00
30-30.9	.84	39-39.9	1.02
31-31.9	.86	40-40.9	1.04
32-32.9	.88	41-41.9	1.06
33-33.9	.90	42-42.9	1.08
34-34.9	.92	43-43.9	1.10
35-35.9	.94	44 and above	1.12
36-36.9	.96		

WEST TEXAS

Humble Oil & Refining Co.

Effective Aug. 23

Crane, Upton, Crockett and Pecos Counties ... $0.60

NORTH LOUISIANA — ARKANSAS FIELDS

***Prices of Standard Oil Co. of Louisiana**
Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton and De Soto

Effective March 14, 1927

Below 28	$1.10	40-40.9	$1.36
28-28.9	1.12	41-41.9	1.38
29-29.9	1.14	42-42.9	1.40
30-30.9	1.16	43-43.9	1.42
31-31.9	1.18	44-44.9	1.44
32-32.9	1.20	45-45.9	1.46
33-33.9	1.22	46-46.9	1.48
34-34.9	1.24	47-47.9	1.50
35-35.9	1.26	48-48.9	1.52
36-36.9	1.28	49-49.9	1.54
37-37.9	1.30	50-50.9	1.56
38-38.9	1.32	51-51.9	1.58
39-39.9	1.34	52 and above	1.60

Smackover, below 24	*$1.00
do 24 and above	* 1.25
Bellevue	1.25
Cotton Valley	1.00
**Urania, La.	1.00
†East El Dorado	1.00

**Posted by Louisiana Oil Refining Corp.

†Posted by Magnolia Petroleum Co.

*Met on July 6 by Louisiana Oil, Atlantic Oil Producing, and Shreveport — El Dorado Pipe Line Co.

STEPHENS, ARKANSAS

Atlantic Oil Producing Co. and Louisiana Oil Refining Corp.

Below 28	$1.00	30-30.9	$1.06
28-28.9	1.02	31-31.9	1.08
29-29.9	1.04	32 and above	1.10

GULF COASTAL

Posted by Humble Oil & Refining Co.

Effective March 14

Grades A	$1.20	29-29.9	$1.25
Grades B:		30-30.9	1.27
Below 25	1.15	31-31.9	1.29
25-25.9	1.17	32-32.9	1.31
26-26.9	1.19	33-33.9	1.33
27-27.9	1.21	34-34.9	1.35
28-28.9	1.23	35 and above	1.37

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only.

California Market Prices Hold But Tanker Rates Fall

Staff Special
LOS ANGELES, Sept. 10

THE California oil market this week has been hazy and the best thing that can be said for it is, that there has been no notable weakening. Quotations continue around former figures, except for fuel oil, price of which has been boosted a little.

Tanker charter rates are off everywhere, with bottoms available at the new low prices. For instance, a tanker may be secured to move fuel or crude from Gulf points to New York area at 22½ to 25 cents a barrel, about half the rate some 10 months ago.

A clean bottom can be chartered out of California ports for East Coast points at 70 to 75 cents, but a bottom to carry refinable crude can be chartered at 60 cents a barrel, with vessels to carry fuel 5 cents higher.

As the rates are now lower than they have been for a long time, the major refiners are now asking 80 to 90 cents a barrel for the fuel oil for export against an old price of 70 cents. By paying 80 cents here, plus transportation cost of 65 cents, it can be seen that California fuel can be moved to New York at a cost of $1.45, plus small items of insurance and loss.

But the tightening of fuel oil export prices has had no effect on the quotations for fuel oil in tank cars to move in the Pacific Coast trade territory. These quotations on the part of the small refiners continue to range from 65 cents up.

Diesel oil 27° gravity and lighter can be moved at 80 cents to $1, the range caring for both local movement and export prices. Gas oil is slightly firmer due to the boost in asking price for fuel oil. In the week ended Sept. 3, three cargoes of gas oil went to Atlantic seaboard ports from Los Angeles harbor.

The retail gasoline situation in California is slightly improved, with less chance of a price reduction. The major refiners as well as the Independents are anxious to escape a price cut, and there is less tendency to cut prices to move their stocks.

The Independents are now selling their gasoline in southern California at 2 cents under the major companies, and the majors are saying nothing. But the moment this already low price is reduced, something will pop wide open, and a few more financial statements will be badly affected.

One of the larger refiners, making great efforts to get a real foothold as a marketer during the week boosted its quotations on gasoline slightly,

Purchasers, in All Fields (in Effect September 12, 1927)

OIL PRICE HANDBOOK published annually)

GULF COASTAL

Prices of The Texas Co.

(Effective March 14)

Grades A.....$1.20	*Grades B.....$1.15
‡Grades B (light crude):	
35-35.9.....$1.37	38-38.9.....$1.43
36-36.9..... 1.39	39-39.9..... 1.45
37-37.9..... 1.41	40 and above.... 1.47

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS

Prices of Ohio Oil Co. and Midwest Refining Co.

(Salt Creek prices effective March 12)

‡Salt Creek 29-29.9	$1.14
" " 30-30.9	1.16
" " 31-31.9	1.18
" " 32-32.9	1.20
" " 33-33.9	1.22
" " 34-34.9	1.24
" " 35-35.9	1.26
" " 36-36.9	1.28
" " 37 and above	1.30
Elk Basin	1.33
Grass Creek light	1.33
Big Muddy	$1.25
Lance Creek	1.33
Rock Creek	1.25
Mule Creek	1.30
Rex Lake	1.10
‡Osage	1.33
‡Cat Creek, Mont.	1.33
Sunburst, Mont.	1.35
‡Hogback, N. Mex.	1.38
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

CALIFORNIA

Standard Oil Co. of California

Santa Maria and Ventura Posted by Union Oil Co.

Gravity	Signal Hill Seal Beach Huntington Beach	Inglewood Torrance	Whittier La Habra	Newhall, McKittrick, Kern River	Olinda-Brea Canon, Richfield	Athens-Rosecrans Dominguez	Montebello	Coyote Hills	Santa Fe Springs	Midway Sunset Buena Vista & Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria	Ventura
14-14.9	$ .85	$ .85	$ .85	$ .75	$ .85	....	$ .85	$ .85	....	$ .75	$ .75	$ .75	$ .75	$ .85	$ .5
15-15.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
16-16.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
17-17.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
18-18.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
19-19.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
20-20.9	.85	.85	.85	....	.85	....	.85	.85	....	.77	.77	.76	.78	.85	.85
21-21.9	.86	.86	.85	....	.86	....	.85	.86	....	.79	.79	.77	.81	.85	.85
22-22.9	.87	.87	.85	....	.87	....	.85	.87	....	.81	.81	.78	.85	.85	.85
23-23.9	.88	.88	....	....	.88	....	.85	.88	....	.83	.83	.79	.89	.85	.85
24-24.9	.89	.89	....	....	.89	$ .89	.85	.89	.85	$ .85	.85	.80	.93	.85	.85
25-25.9	.90	.90	....	....	.90	.90	.86	.90	.85	.87	.87	.81	.97	.86	.86
26-26.9	.92	.92	....	....	.92	.92	.87	.91	.85	.89	.89	.83	1.01	.87	.87
27-27.9	.94	.94	....	....	.94	.94	.88	.92	.85	.91	.91	.85	1.05	.88	.88
28-28.9	.96	.96	....	....	.96	.96	.89	.93	.86	.93	.93	.87	....	.89	.89
29-29.9	.98	....	....	....	.98	.98	.90	.94	.87	.96	.96	.89	....	.91	.91
30-30.9	1.00	....	....	....	1.00	1.00	.91	.95	.88	.99	.99	.91	....	.93	.93
31-31.9	1.03	....	....	....	....	1.03	....	....	.89	1.02	1.02	.93	....	....	.95
32-32.9	1.06	....	....	....	....	1.06	....	....	.91	1.05	1.05	.95	....	....	.97
33-33.9	....	....	....	....	....	1.09	....	....	.93	1.08	1.08	.97	....	....	.99
34-34.9	....	....	....	....	....	1.12	....	....	.95	....	1.11	.99	....	....	1.01
35-35.9	....	....	....	....	....	1.15	....	....	.97	....	....	1.01	....	....	1.03
36-36.9	....	....	....	....	....	1.18	....	....	.99	....	....	....	....	....	1.06
37-37.9	....	....	....	....	....	1.21	....	....	1.01	....	....	....	....	....	1.09
38-38.9	....	....	....	....	....	1.24	....	....	1.03	....	....	....	....	....	1.12
39-39.9	....	....	....	....	....	1.27	....	....	1.06	....	....	....	....	....	1.15
40-40.9	....	....	....	....	....	1.30	....	....	1.09	....	....	....	....	....	....
41-41.9	....	....	....	....	....	1.33	....	....	1.12	....	....	....	....	....	....
42-42.9	....	....	....	....	....	1.36	....	....	1.15	....	....	....	....	....	....

*Union Oil Co. also purchases Long Beach Crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees and in Santa Fe Springs, on gravities ranging from 20 to and including 23.9 degrees.

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coming back into the range followed rather closely by other major companies.

Quotations for export gasoline in cargo lots continues to be around 6 cents, while the range for gasoline in tank cars to be shipped to points outside of California is 7.25 to 8.50 cents. Two weeks ago a few cars could be bought at 7 cents, but in the last few days, most refiners, large and small, want a fraction above 7 cents. This is without tax.

The natural gasoline situation is gradually clarifying itself, with practically no cheap spot stuff on the market. A few new 12-month contracts have been made at 4.50 cents under present offical tank wagon price, without tax, which is 9 cents. Several contracts exist which net the manufacturer 10 cents. The signing of a few more contracts at 9 cents, under present tank wagon price, would boost the spot market to 9 cents as a low spot price.

* * *

Los Angeles Shipments

Staff Special

LOS ANGELES, Sept. 10

During eight months ended with August, total of 47,062,907 barrels of all petroleum products were shipped out of Los Angeles harbor to points outside the Pacific Coast trade territory. This total included 26,413,178 barrels of fuel oil, including gas oil; 8,945,838 barrels of gasoline and 7,366,592 barrels of crude. The balance was made up of kerosene, distillates, etc. Of the grand total, 5,903,343 barrels represented the total moving during August.

During the week ended Sept. 3, the movement out of Los Angeles Harbor totaled 1,277,433 barrels, or daily average of 182,490 barrels, all products. This compares with total of 1,446,375 barrels, or daily average of 206,625 barrels, for the previous week. Last week's total included 156,429 barrels of crude, 594,752 barrels of fuel, 220,028 barels of gasoline, 233,937 barrels of gas oil, 8164 barrels of Diesel and 64,123 barrels of lube distillate.

The gas oil represented three cargoes to Baltimore, Boston and New York. Of the total fuel oil movement, 348,918 barrels went to Pacific foreign. The crude went to Atlantic domestic.

L. W. Kesler, district geologist of Sinclair Oil & Gas Co., at Wichita, is the new president of the Kansas Geological Society. John R. Reeves of Empire Gas & Fuel Co., is vice president and John L. Garlough, consultant, is secretary-treasurer. Anthony Folger of Gypsy Oil Co., and F. G. Holl, consultant, are members of the board of directors.

OIL STOCKS AND FINANCES

National Petroleum News

Pan American Western Nets 32c a Share

NEW YORK, Sept. 9.—Pan American Western Petroleum Co., which was organized by E. L. Doheny to take over the California properties of the Pan American Petroleum & Transport Co., when control of the latter was sold to Standard Oil Co. of Indiana and associated British and New York banking interests, netted only 32 cents a share on the 100,100 shares of class A voting and 400,000 shares of class B non-voting stock in the first half of this year. In the first half of 1926 the company netted $3.25 a share on the combined stocks. These returns were after all charges and reserves including federal income taxes.

In the quarter ended June 30, the company lost $96,324 after interest and reserves. In the preceding quarter the company netted 52 cents a share. In the second quarter of 1926 the net was $3.42 a share.

Pan American Western's consolidated income account for the first halves of 1926 and 1927 compared:

	1927	1926
Gross sales	$14,848,565	$16,422,758
Operating costs	11,439,324	11,806,589
Gross profit	$ 3,409,241	$ 4,616,169
Depreciation, depletion, interest and fed. tax	3,245,427	2,989,051
Net profit	$ 163,814	$ 1,627,118

S. O. Indiana Authorizes More Capital Stock

CHICAGO, Sept. 10.—Stockholders of the Standard Oil Co. of Indiana, who met yesterday at Whiting, Ind., voted to increase the authorized amount of capital stock 50 per cent to $375,000,000. Last Dec. 31 the company had outstanding $228,415,463 par value capital stock. Under the new authorization there will be 15,000,000 $25 shares.

The stockholders also authorized exchange of 37,500 shares of Standard of Indiana stock for 150,000 shares of Pan American Eastern Petroleum Co. stock. The latter is the holding company which owns a majority of the voting stock of the Pan American Petroleum & Transport Co.

The Pan American Eastern was organized early in 1925 by the Standard of Indiana, Blair & Co. and Chase Securities Corp. of New York, and British interests headed by Lord Inverforth to purchase the stock of the Edward L. Doheny interests in Pan American Petroleum & Transport Co. In June the Indiana company which had had only about $3,000,000 invested in Pan American Eastern, acquired the holdings of Blair & Co. and Chase Securities Corp.

The purpose of the increase in authorized capital of the Indiana company was not announced or for whose interest in Pan American Eastern an offer probably will be made. The increase will enable the Indiana company to provide for expansion at the discretion of the directors or, as is hoped in stock market circles, a stock dividend. The latter seems unlikely in the early future because of the disturbed conditions in the oil industry this year although the company's earned surplus as of last Dec. 31 was $108,000,000. The authorized capital of the Pan American Eastern is 550,000 shares.

Tide Water-Associated Nets 17c on Common

NEW YORK, Sept. 9.—Tide Water Associated Oil Co. in the first half of this year netted 17 cents a share on the 4,796,597 outstanding no par common shares after interest, all reserves, federal income taxes and dividends on the 6 per cent preferred stock.

Tide Water Oil Co. and subsidiaries including Tidal Osage Oil Co. in the half year netted $2,638,456 after all charges and reserves, equivalent to 97 cents a share on the 2,168,257 shares of no par common stock. In the first half of 1926 Tide Water and subsidiaries, exclusive of the Tidal Osage Oil Co., netted $2,848,218, equivalent to $1.07 a share on 2,138,373 shares of common stocks. Net to common stated in both instances was after dividends on the preferred stock.

Associated Oil Co. in the first half of 1927 netted $1,331,475 equivalent to 58 cents a share on 2,290,412 shares of stock. In the first half of 1926 net was $2.11 a share.

Consolidated income account of the Tide Water Associated for the first six months of 1927 follows:

Gross sales	$81,165,623
Operating expenses, etc.	68,855,106
Operating income	$12,310,517
Other income	652,921
Total income	$12,963,438
Interest	674,054
Depreciation and depletion	6,311,739
Estimated federal taxes	638,779
Minority interest, etc	2,341,730
Net income	$ 2,997,136
Preferred dividends	2,182,369
Common dividends	2,873,367
Deficit	$ 2,058,600
P. & L. surplus	2,313,011

Consolidated income accounts of Tide Water Oil Co. for the first halves of 1926 and 1927 compare:

	*1927	1926
Gross sales	$45,379,706	$40,978,935
Operating income	7,527,163	6,381,168
Total income	$ 7,998,811	$ 6,963,056
†Net income	2,638,456	2,848,218
Preferred dividends	517,630	557,515
Common dividends	1,243,060	1,603,283
Surplus	$ 877,766	$ 687,420

*Includes operations of Tidal Osage Oil Co. subsidiary previously carried as an affiliated, but not as consolidated company. †After depreciation, depletion, minority stockholders proportion of profits, federal taxes, etc.

Consolidated income accounts of the Associated Oil Co. for the first halves of 1926 and 1927 compare:

	1927	1926
Gross sales	*$39,743,404	.....
Operating income	4,546,647	$9,165,348
Other income	154,541	.....
Total income	$ 4,701,188	$9,165,348
†Net income	1,331,475	4,836,089

*Gross sales and earnings exclusive of intercompany sales and transactions.
†After depreciation, depletion, interest, federal taxes, etc.

Barnsdall Denies Short Term Bonds Planned

NEW YORK, Sept. 9.—Following reports that Barnsdall Corp. contemplated issuing short term bonds, M. C. Brush, chairman of the board, issued this statement:

"Barnsdall Corp. has no intention of issuing any such securities or making any new arrangements for financing whatsoever, and I believe its cash and quick assets are amply sufficient for its corporate purposes.

"Barnsdall Corp.'s crude oil production is now averaging approximately 40,000 barrels net a day. Its net earnings for July, after ample depletion and depreciation, exceeded $572,000. On the basis of present crude prices, E. B. Reeser, president, estimates net earnings for August will easily exceed $750,000, and should continue throughout the rest of the year in excess of that amount per month. If September shows earnings only equal to July, the third quarter would show earnings of $1.60 a share, as compared with $1.43 a share for the first and second quarters combined."

Transactions in Oil Shares on New York Stock Exchange

1926 High	1926 Low	1927 High	1927 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Sept. 10 Sales	First	High	Low	Last	Change
32⅛	24¼	37⅝	27⅝	(sh) 915,675	N.P.	Amerada Corp.	50cQ	July 30, 27	1,400	29¼	29⅞	29¼	29½	+ ⅛
74	39⅞	64⅞	35⅛	(sh) 209,180	N.P.	American Republics	.....	.....	12,900	45¼	48⅝	45⅛	46	+ 1
59¾	44¾	50¼	42	$ 56,000,000	$25	Associated Oil	‡50cQ	June 25, 27	.....	.....	.....	.....	.....	.....
128¾	97	131⅜	107	50,000,000	100	Atlantic Refining	$1Q	Sept. 15, 27	18,900	118	123½	117¾	121¼	+ 3⅛
120	115½	118	115½	20,000,000	100	do pfd.	$1.75Q	Aug. 1, 27	.....	.....	.....	.....	.....	.....
33⅛	23½	35⅛	20⅞	25,000,000	25	Barnsdall Corp. A	62½cQ	July 15, 27	11,200	22⅞	23¾	22¾	23⅜	+ ⅜
29½	22½	32½	21¼	3,840,275	25	do B	62½cQ	July 15, 27	.....	.....	.....	.....	.....	.....
68⅛	29¾	32⅛	21⅞	49,505,175	25	California Petroleum	25cQ	Sept. 1, 27	8,200	22½	23⅜	22¼	23⅜	+ ⅜
94¼	50	96¾	65	24,242,500	100	General Asphalt	.....	.....	39,900	70¼	76¼	70	74	+ 4
140½	94⅛	144⅛	107¼	6,949,200	100	do pfd.	$1.25Q	Sept. 1, 27	1,300	116½	118¾	115½	116	+ 5
72	50¼	174½	60⅛	25,000,000	100	Houston Oil	.....	.....	238,600	127¼	158½	127¼	153	+27½
84	19⅝	32¾	17⅝	(sh) 500,000	N.P.	Independent Oil & Gas	25cQ	July 18, 27	4,200	20⅛	20⅜	20	20¼	+ ¼
13¾	7¼	11⅛	7½	$ 3,280,340	$10	Indian Refining	.....	Dec. 15, 20	26,900	8⅞	12⅛	8¾	11⅜	+ 2½
12½	8	10⅞	7¼	4,550,110	10	do ctfs.	.....	.....	24,200	8¾	12	8¾	11	+ 2¼
104	90	112	99⅞	2,296,400	100	do pfd.	.....	Dec. 15, 21	700	107	112	107	110	+ 8
24½	19¼	32½	20½	(sh) 3,988,044	N.P.	Lago Oil & Transport	75cQ	Aug. 1, 27	4,200	30½	32	30½	31¼	+ 1
19⅞	12	18⅛	10½	(sh) 1,135,662	N.P.	Louisiana Oil Refining	.....	.....	6,800	10⅝	11⅜	10⅝	11⅛	+ ⅛
98	93	97	90	$ 4,000,000	$100	do pfd.	$1½Q	Aug. 15, 27	120	90½	91	90½	91	0
28⅞	16⅛	22¾	13	(sh) 330,000	N.P.	Maracaibo Oil	.....	.....	600	15	15⅛	15	15⅛	0
63⅜	49¼	58½	31	(sh) 2,308,064	N.P.	Marland Oil Co.	.....	Mar. 31, 27	24,800	35½	37	35½	36⅜	+ ½
250	225	250	200	$ 45,942,800	$100	Mexican Petroleum	$3Q	July 20, 27	.....	.....	.....	.....	.....	.....
....	....	....	....	12,000,000	100	do pfd.	$2Q	July 20, 27	.....	.....	.....	.....	.....	.....
13¾	6	9¼	3	(sh) 945,939	N.P.	Mexican Seaboard	.....	Nov. 15, 24	1,700	4	4	3⅝	4	— ⅛
37	27½	39⅜	29	(sh) 1,357,800	N.P.	Mid-Continent Petroleum	75cQ	Aug. 1, 27	10,600	31	31¼	30⅜	30½	— ½
104¼	90	105	97	$ 6,718,000	$100	do pfd.	$1.75Q	Sept. 1, 27	100	103	103	103	103	+ ¼
2½	¾	3¾	1⅛	24,726,130	10	Middle States	.....	July 1, 23	7,200	2½	2⅝	2½	2⅝	+ ⅛
1⅜	½	2¾	1½	5,074,090	...	do ctfs.	.....	.....	800	2	2	1¾	2	+ ¼
2¼	1	1⅞	1	(sh) 3,500,000	N.P.	Pacific Oil	.....	.....	700	1⅛	1¼	1⅛	1⅛	0
76⅛	56⅛	65⅞	45⅛	$ 48,307,400	$ 50	Pan American P. & T.	$1.50Q	July 20, 27	5,200	48⅜	49½	47	49½	+ ¼
78⅜	56⅞	66⅜	45⅝	121,096,950	50	do B	$1.50Q	July 20, 27	61,400	48⅛	49⅞	47	49½	+ ¾
46	30	37⅞	19	(sh) 400,000	N.P.	Pan American Western B.	.....	Jan. 30, 27	3,700	20¼	20¼	19⅝	19⅞	— ⅛
62	4½	18⅞	8	(sh) 198,770	N.P.	Panhandle P. & R.	.....	.....	400	9	9⅝	8¾	9⅜	+ ⅜
99¾	51	83¾	58¾	$ 2,935,200	$100	do pfd.	.....	July 2, 23	200	54	54	54	54	— 4
57⅝	40	60¼	38	(sh) 2,406,796	N.P.	Phillips Petroleum	75cQ	July 1, 27	36,700	43	44⅛	42⅜	43¾	+ 1⅛
1⅞	½	1⅞	½	$ 29,622,925	$ 25	Pierce Oil Corp.	.....	.....	8,900	⅜	¾	½	¾	0
27⅛	11½	24	13½	15,000,000	100	do pfd.	.....	Feb. 1, 22	100	17	17	17	17	+ ¼
7	2¼	5⅛	2½	(sh) 2,500,000	N.P.	Pierce Petroleum	.....	.....	1,300	3⅛	3⅜	3⅛	3⅜	+ ⅛
20⅜	11	33⅞	16¾	$ 11,467,850	$50	Producers & Refiners	.....	Sept. 15, 23	3,600	22½	26⅜	22½	25⅜	+ 2¼
41¾	30⅜	50	36⅞	2,845,350	50	do pfd.	.....	May 1, 25	140	41	44⅞	41	42	+ 1
31	25¼	33½	25⅝	75,929,250	25	Pure Oil Co.	‡37½cQ	Sept. 1, 27	6,300	26⅝	26⅞	26⅛	26¼	— ⅛
112¾	106	114	111⅜	13,000,000	100	do 8% pfd.	$2Q	July 1, 27	7,000	113½	113½	113½	113½	+ 2½
57⅜	47⅜	58	45¼	(sh) 628,559	13.40	Royal Dutch, N. Y. shares	$1.80	Aug. 2, 27	4,100	46	47	45⅞	47	+ 2¾
40⅜	40½	47⅛	42⅛	(sh) 83,152	F2	Shell Transport & T	$1.45	July 22, 27	100	43¼	43¼	43¼	43¼	+ ⅜
31	24	31¾	25	(sh) 10,000,000	N.P.	Shell Union Oil	35cQ	June 30, 27	2,500	26¼	26⅜	26	26½	+ ½
114	103	111	107½	$ 18,350,400	$100	do pfd.	$1½Q	Aug. 15, 27	.....	.....	.....	.....	.....	.....
28⅝	15½	22¾	14¼	7,208,080	10	Simms Petroleum	.....	Apr. 1, 27	900	15½	16½	15½	15⅞	+ ¼
24⅞	16¾	22⅜	16	(sh) 4,501,224	N.P.	Sinclair Consolidated	.....	May 31, 24	20,300	16¾	17⅜	16⅝	17⅛	+ ½
99½	90	103¼	97	$ 17,210,000	$100	do pfd.	$2Q	Aug. 15, 27	.....	.....	.....	.....	.....	.....
37½	26⅝	37⅝	24⅛	27,398,500	25	Skelly Oil Co.	50cQ	Sept. 15, 27	1,600	26¼	27⅜	26¼	26⅝	+ ¾
63⅜	52⅝	60¾	50⅜	(sh) 13,016,434	N.P.	S. O. California	62½cQ	Sept. 15, 27	16,400	53	55½	53	54½	+ 1⅛
46⅜	37⅜	41⅜	35¼	$ 604,484,600	$25	S. O. New Jersey	‡25cQ	Sept. 15, 27	59,200	38⅞	39⅞	38½	39¾	+ 1⅛
33¼	32½	34⅛	29¾	421,498,275	25	S. O. New York	40cQ	Sept. 15, 27	15,200	31⅛	31⅜	31	31¼	0
41⅜	30⅛	34⅞	30	(sh) 1,171,474	N.P.	Sun Oil	25cQ	Sept. 15, 27	1,200	32⅜	32⅜	32	32	0
....	....	100	99	$ 6,000,000	$100	do. pfd.	$1.50Q	Sept. 1, 27	.....	.....	.....	.....	.....	.....
5¼	1	6½	3¾	(sh) 1,121,368	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	4,100	3⅞	3⅞	3¾	3¾	— ⅛
57⅛	53⅛	58	45	$ 179,752,525	25	The Texas Corp.	75cQ	July 1, 27	77,000	49⅜	51⅞	49⅛	50½	+ 2
19½	12	18⅞	12	8,380,340	10	Texas Pacific Coal & Oil	.....	Mar. 31, 27	6,500	13⅞	14⅝	13⅞	14	+ ¼
39¼	37	29⅛	22	(sh) 2,157,991	N.P.	Tide Water Oil Co.	20cQ	June 30, 27	400	23	23¾	23	23¼	+ 1¼
103	87¼	89¾	86	$ 20,705,100	$100	do 5% pfd.	$1.25Q	Aug. 15, 27	300	88½	88¾	88½	88⅝	— ⅜
....	....	19⅛	15½	(sh) 4,791,410	N.P.	Tide Water Associated	15cQ	Aug. 1, 27	2,800	16¾	17⅜	16¼	16¾	0
....	....	90¾	87	$ 76,347,100	$100	do pfd. new	$1.50Q	July 1, 27	4,300	88	88	87	87	0
5⅛	3	9¾	3¾	(sh) 3,742,029	N.P.	Transcontinental Oil	.....	.....	76,400	8⅛	8⅜	7⅝	8	0
58⅝	37¼	56¾	39⅜	$ 40,741,725	$ 25	Union Oil of California	50cQ	Aug. 10, 27	5,400	42	43⅜	42	43¼	+ 1¼
120⅜	84¼	116¼	94	30,734,000	100	Union Tank Car Co.	$1.25Q	Sept. 1, 27	400	111	111	110¾	111	+ 1
....	....	28½	24½	(sh) 239,860	N.P.	Warner Quinlan	50cQ	July 2, 27	500	25¼	25¾	25	25¾	+ ¼
29¾	25⅛	27½	22	(sh) 490,000	N.P.	White Eagle Oil & Refining	50cQ	July 20, 27	600	22½	22⅝	22⅝	22⅝	+ ⅛

•New High †New Low xEx-Dividend ‡Also extras Total Sales 881,160

South Penn to Build New Tank Farm

OIL CITY, Pa., Sept. 10.—The South Penn Oil Co., one of the largest producers of Pennsylvania grade crude oil, has purchased a 40-acre farm on a hill that adjoins the property of the Pennzoil Co., Oil City, refiners and marketers of Pennzoil motor oil and petroleum products, and has contracted for the erection of six 80,000-barrel steel storage tanks with gas tight steel roofs. Surplus crude oil which is now stored in various rented tanks, will be transferred to the new farm to prevent any possible interruption at the refinery in case of a break-down or congestion in the pipe lines that carry oil to Rouseville.

South Penn owns a controlling interest in Pennzoil.

Oil Dividends

	Amount	Payable	Stock of Record
Borne Scrymser s.a.	$1	Oct. 15	Sept. 27
do extra	75c	Oct. 15	Sept. 27
British-American q.	20c	.....	Sept. 14
Humble Oil q.	30c	Oct. 1	Sept. 10
do extra	20c	Oct. 1	Sept. 10
Mountain Prod. q.	65c	Oct. 1	Sept. 15
Pure Oil 8½ pfd., q.	$2	Oct. 1	Sept. 10
do 6% pfd., q.	$1.50	Oct. 1	Sept. 10
do 5¼% pfd., q.	$1.25	Oct. 1	Sept. 10
Salt Creek Cons. q.	20c	Oct. 1	Sept. 15
Shaffer O. & R. pfd., q	1¾%	Oct. 25	Sept. 30
South Penn q.	50c	Sept. 20	Sept. 13
S. O. Kentucky q.	$1	Sept. 30	Sept. 15
Texas Pacific q.	15c	Sept. 30	Sept. 14
Tidal Osage q.	50c	Sept. 19	Sept. 2
Tide Water Oil q.	20c	Sept. 30	Sept. 12
Warner Quinlan q.	50c	Oct. 1	Sept. 15
do pfd. q.	1⅜%	Oct. 1	Sept. 15

Cleveland Stock Market

September 9

	Par Value	Bid	Asked	Last Sale
Canfield Oil Co.	100	...	...	100
do pfd.	100	98¾	...	100
Fred G. Clark Co.	10	...	3	3¼
National Refining Co.	25	35	36	35¼
do pfd.	100	...	...	130
Paragon Refining Co.	25	8	9	8½
do pfd.	100	84	...	81

Kansas Gas Producers Form New Company

TULSA, Sept. 10.—The Southern Kansas Gas Co., a new organization formed through consolidation of a number of Kansas gas producers, included in the merger J. B. Kirk Gas & Smelting Co., Ash Grove Lime & Portland Cement Co., Peerless Oil & Refining Co., and other smaller companies. The new company now owns 76,100 acres of leases and gas purchase contracts on 9,880 acres, all located in southeastern Kansas. Properties include 493 producing wells, 327 miles of transmission lines, and six compressor stations. The new company will supply gas at wholesale to the cities of Iola and Chanute and will own and operate the distribution system in Erie.

Standard Oil Stock Traded in New York

1926 High	1926 Low	1927 High	1927 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Sept. 10 Sales	First	High	Low	Last	Ch'ge
21	16⅜	21⅝	17⅝	£ 4,000,000	£ 1	Anglo-American Oil	60¾c	May 31, 27	200	18¾	18⅞	18¾	18¾	+ ¼
20¼	16½	20½	17⅝	.....	£ 1	do ctfs. non-voting	.....	.....	500	18¾	18¾	18½	18½	— ½
2¼	.75	1¼	.75	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	400	99	100	99	100	+25
5	2⅞	4¼	2½	$ 10,000,000	$ 10	do pfd.	.....	.....	200	3½	4	3½	4	+ 1⅛
75	65	69	50	1,000,000	25	Borne Scrymser	‡$1S.A.	Apr. 15, 27	50	62½	62½	62½	62½	+ 2
59½	42	59	45	10,000,000	50	Buckeye Pipe Line	$1Q	Sept. 15, 27	150	56¼	56¼	56	56	— ¼
82½	65	115	76½	3,000,000	25	Chesebrough Mfg.	$1Q	June 30, 27	100	109½	109½	109½	109½	0
25⅞	17½	22⅝	16½	38,805,260	10	Continental Oil	25cQ	Sept. 15, 27	9,000	18½	19⅜	18½	19	0
137	102	137	89	3,000,000	100	Cumberland Pipe Line	$2Q	Sept. 15, 27	.....	.....	.....	.....	.....	.....
63¾	43	58½	47	5,000,000	100	Eureka Pipe Line	$1Q	Aug. 1, 27	.....	.....	.....	.....	.....	.....
32½	9⅛	13½	7⅛	16,000,000	100	Galena Signal Oil	.....	June 30, 25	700	8	8⅛	8	8	0
94½	35	59¾	35	4,000,000	100	do new pfd.	.....	June 30, 26	.....	.....	.....	.....	.....	.....
97½	40	60⅛	36	2,000,000	100	do old pfd.	.....	June 30, 26	30	43	43	43	43	+ 1½
99⅝	52	63⅞	54	73,117,577	25	Humble Oil & Refining	‡30cQ	July 1, 27	9,100	61½	62½	60½	61¾	+ ⅛
144½	125¼	164¾	123¾	20,000,000	100	Illinois Pipe Line	$6S.A.	June 15, 27	550	161¼	161¾	161¼	161½	+ ½
39¾	32½	55¾	37¾	(sh) 6,491,952	N.P.	Imperial of Canada	‡25cQ	Sept. 1, 27	20,800	52¾	55¼	51⅝	53¾	+ ¾
70	54¼	72½	61	$ 5,000,000	$50	Indiana Pipe Line	$1Q.	Aug. 15, 27	100	70¼	70¾	69½	69½	— ¾
35¼	28¾	34⅞	28	(sh) 7,118,138	N.P.	International Petroleum	25c	June 15, 27	17,800	31¾	32¼	31⅜	32	— ⅞
20¾	12½	17	13½	$ 6,362,500	$12½	National Transit Co.	25cQ	June 15, 27	100	15¾	15¾	15¾	15¾	+ ¼
51½	27⅛	37	31¼	5,000,000	100	New York Transit	.....	July 15, 26	.....	.....	.....	.....	.....	.....
80½	64	91	70	4,000,000	100	Northern Pipe Line	$3S.A.	July 1, 27	.....	.....	.....	.....	.....	.....
67⅝	55¾	64¼	52	60,000,000	25	Ohio Oil Co.	‡50cQ	Sept. 15, 27	7,900	62½	62½	60¾	60⅞	— 1⅝
24⅜	15	31	12	10,000,000	25	Penn Mex. Fuel	.....	May 21, 25	300	23	23⅜	23	23⅜	+ ⅜
60¼	48	55½	45⅝	60,000,000	25	Prairie Oil & Gas	50cQ	Aug. 31, 27	4,900	51⅞	51⅞	51	51	— ⅞
137½	122¼	186	132	81,000,000	100	Prairie Pipe Line	$2.50Q	July 31, 27	850	181¾	182	180½	180¾	— ½
220	184½	201½	180	4,000,000	100	Solar Refining	$5S.A.	June 20. 27	90	183	185	182	185	+ 3
.7	21	27¼	15½	5,000,000	50	Southern Pipe Line	.....	Mar. 1, 26	200	18½	18½	18½	18½	— ½
50	34½	41½	34½	20,000,000	25	South Penn Oil	50cQ	June 30, 27	300	37⅛	37⅜	37⅛	37¾	+ ⅜
57	49	77	55½	3,500,000	100	South West Pa. Pipe Lines	$1Q	July 1, 27	.....	.....	.....	.....	.....	.....
70⅛	60⅛	75⅞	64¾	228,415,463	25	S. O. Indiana	‡62½cQ	Sept. 15, 27	41,100	75½	*75⅞	73¾	73⅞	— 1⅝
36½	16½	20⅞	15⅝	8,000,000	25	S. O. Kansas	.....	June 16, 24	300	16⅝	16¾	16⅝	16⅝	— ⅛
134¾	108	123¾	111½	17,012,599	25	S. O. Kentucky	$1Q	June 30, 27	600	121¾	123¾	121¾	123¾	+ 1¼
51⅛	42	49½	42	4,559,850	25	S. O. Nebraska	63cQ	Sept. 20, 27	100	45	45	45	45	— ⅜
672	288	863¾	73	14,000,000	25	S. O. Ohio	62½cQ	July 1, 27	21,000	80	80	79½	79½	— 1
120½	116½	122	117¼	7,000,000	100	do pfd.	$1.75Q	Sept. 1, 27	40	120	121½	120	121½	+ 1½
23	15½	18	14½	861,466	25	Swan Finch Co.	.....	Nov. 1, 19	400	17½	17½	16¾	17½	0
109¼	90¼	134⅝	95¼	62,470,800	25	Vacuum Oil	‡50cO	Sept. 20, 27	1,600	128	129	127¼	128⅞	+ ⅞

•New high †New low xEx dividend ‡Also extras.

New York Bonds

Week Ending Sept. 9

	High	Low	Last	Ch'ge
Amer. Rep. deb. 6s	99⅝	99½	99½	0
Assoc. Oil gold 6s	103	102½	103	0
Atlantic Refg. deb. 5s	101¾	101	101¾	+ ¼
Barnsdall Corp. 6s	98¾	98¼	98¾	+ ⅜
Barnsdall Corp. 6s ex-war	92	89½	89½	—1⅞
Cal. Petrol 5s	93⅞	93½	93½	0
Cal. Petrol 5½s	98	97¾	97¾	+ ½
Empire Gas & Fuel 7½s	110	110	110	— ½
Empire Gas & Fuel 6½s	105½	105½	105½	0
Gen. Asphalt 6s	106⅝	106	106⅝	+ ⅝
Gen. Petroleum 5s	101½	101¼	101½	+ ½
Humble Oil & Refg. 5½s	102⅝	102½	102⅝	+ ⅜
Humble Oil 5s wi	99⅝	99¼	99⅝	+ ½
Mid-Cont. Pet. 6½s	105½	104½	105⅛	+ ⅝
Pan Amer. P & T 7s	105⅝	105⅝	105⅝	0
Pan Amer. P & T 6s	102¼	102⅛	102¼	0
Pan Amer. P & T. 7s	94¾	94¼	94¼	— ⅛
Prod. & Refnrs. 8s ex.war	111	111	111	+1
Prod. & Refnrs. 8s war	111⅝	111⅝	111⅝	—1⅞
Sinclair Con. Oil Col. 7s	100¼	99⅜	100⅛	+ ⅜
Sinclair Con. Oil Con 6½s	96⅜	95⅞	95⅞	0
Sinclair Con. Oil 6s	100¼	100⅜	100⅛	0
Sinclair Crude Oil 6s	100½	100⅜	100⅜	+ ⅜
Sinclair Pipe line sf 5s	93¼	93	93⅜	+ ⅛
Skelly Oil 5½s	95⅜	95	95⅜	0
S. O. N. Y. 4½s	96¼	95⅞	96⅛	+ ⅛
S. O. of N. J. deb. 5s	103½	103¼	103½	+ ⅜
Union Oil of Cal. 6s-A	108½	108½	108½	0
Union Oil of Cal. 5s-C	98½	97⅞	98	— ½

New York Curb Bonds

Week Ending Sept. 9

	High	Low	Last	Ch'ge
Beacon Oil 6s '36	101½	100⅝	100⅜	— ⅜
Cities Service 5s '66	90⅜	90⅛	90⅜	0
Cities Service 6s '66	101⅜	101	101¼	+ ¼
Cities Service G 5½s '42	95	93	93⅜	—2⅞
Empire Oil 5½s '42	93¼	92¼	92⅜	—3⅝
Galena S. O. 7s '30	90½	90¼	90½	0
Galena S. O. 6s	98½	99½	98½	— ¾
General Pet. 6s '28	101	100⅞	101	0
Gulf Oil 5s '37	100⅜	100	100	— ½
Gulf Oil Penn 5 '47	100	99⅞	100	0
Indpen. Oil 6s '39	98½	98½	98½	0
Pure Oil 6½s '33	103⅝	103½	103⅝	+ ⅛
Pure Oil 5½s '37	98⅝	98⅜	98½	0
Richfield Oil 6s wi '41	95	92¼	92¼	—2¾
Sinclair Oil 6s	99½	99	99½	0
Skelly Oil	.....	.....	.....	.....
S. O. of N. Y. 6½s '33	104⅞	104½	104½	0
Sun Oil 5½s '39	101	100¾	101	+ ¾
Trans. Cont. Oil 7s '30	113¾	113½	113¾	— ½
United Oil Prod. 8s '31	70⅜	70	70	—6⅞
Warner-Quin. 6s '42	95	95	95	+ ¾
White Eagle 5½s '57	96½	95½	96½	+ ¼

New York Curb Market

1926 High	1926 Low	1927 High	1927 Low	Par Value	Stocks	Transactions Week Ended Sept. 10 Sales	First	High	Low	Last	Change
6¾	45	2⅛	.55	$5	Amer. Con. Oilfields	86,000	68	86	67	82	+14
14½	4	7½	3	N.P.	Amer. Maracaibo	3,200	4	4	3⅜	4	0
8⅜	5¾	9¾	6¾	$10	Arkansas Nat. Gas	300	9⅛	9¼	9⅛	9⅛	— ⅛
20¾	14⅛	20½	15½	N.P.	Beacon Oil	.....	.....	.....	.....	.....	.....
85¼	60	27	20½	N.P.	British American	.....	.....	.....	.....	.....	.....
28⅜	9¼	28¼	14⅜	25c	Carib Syndicate(new)	15,100	23	24⅜	22⅞	23⅛	+ ¼
.....	.....	26	16½	.....	do ctfs. of deposit	.....	.....	.....	.....	.....	.....
51	37½	58¾	40¼	$20	Cities Service	13,500	48⅞	49¼	48¾	49¼	+ ¼
92½	82⅜	92¼	87	100	do pfd.	2,400	90	90½	89¾	90½	+ ¼
8⅜	7⅜	8½	7⅜	10	do pfd. B	200	8¼	8¼	8¼	8¼	0
25¼	19	29¼	22½	10	do bankers' shares	.....	.....	.....	.....	.....	.....
3½	1¾	3⅞	1¾	$1	Colombia Syndicate	2,400	2¼	2¼	2⅛	2⅛	— ⅛
10⅛	8⅛	9½	7	10	Consolidated Royal	.....	.....	.....	.....	.....	.....
16	10	14⅞	9⅞	N.P.	Creole Syndicate	12,300	11¼	11¾	10¾	11	— ¼
7⅜	1⅛	3	1	N.P.	Crown Central	100	1	1	1	1	— ⅛
8½	½	12	4¾	....	Darby Petroleum	.....	.....	.....	.....	.....	.....
....	....	11½	6	....	do trust ctfs.	.....	.....	.....	.....	.....	.....
4	1¾	2½	1¼	N.P.	Derby Oil & Refining	.....	.....	.....	.....	.....	.....
19	13	16¾	10	N.P.	do pfd.	400	10	10	10	10	— ½
7½	2½	3¾	1	N.P.	Gibson Oil	15,500	1¼	1¼	†1	1⅛	— ¼
2	.63	1⅜	40	N.P.	Gilliland ctfs.	400	50	50	50	50	0
98	82	96½	86¼	$25	Gulf Oil Corp.	3,400	91	91¾	90⅞	91⅛	+ ⅛
3⅜	1	2¼	1¼	N.P.	Kirby Petroleum	100	1⅜	1⅜	1⅜	1⅜	— ⅛
12¾	5¾	10⅞	6	N.P.	Leonard Oil & Dev.	6,000	9⅛	9⅜	9	9	— ⅜
27	20	27½	21½	N.P.	Lion Oil & Refg.	.....	.....	.....	.....	.....	.....
46	31	49½	37	$25	Lone Star Gas	1,900	48¾	49	48	48⅛	— ⅝
2¾	2	2⅞	.95	1	Magdalena Synd.	3,800	....	125	†95	95	—30
5½	1⅞	3	1½	10	Mexican-Panuco	.....	.....	.....	.....	.....	.....
1¾	1¼	1⅜	1	1	Mountain & Gulf	.....	.....	.....	.....	.....	.....
26	23	26⅞	22¾	10	Mountain Producers	5,100	24	24⅞	24	24⅝	+ ¼
6¾	5	5⅞	4¾	5	New Bradford	200	4¾	4¾	4¾	4¾	+ ⅜
11¾	2	6¼	4	10	New England Fuel	.....	.....	.....	.....	.....	.....
17	9⅛	16	9¼	1	New Mex. & Ariz.	2,600	10⅛	10⅝	9¾	10¼	— ¼
17	8	13¼	9	25	New York Oil	300	11⅛	11⅛	11⅛	11⅛	— ⅜
12½	8¾	12⅝	10½	N.P.	North Cent. Texas	.....	.....	.....	.....	.....	.....
44¾	33	....	....	$25	Ohio Fuel Corp.	.....	.....	.....	.....	.....	.....
33	28½	27½	21¾	....	Okla. Nat. Gas ctfs.	.....	.....	.....	.....	.....	.....
10⅛	5⅞	9⅜	1¾	N.P.	Pandem	1,500	3	3	†1¾	2⅝	— ⅜
12¾	11¾	12⅞	9⅝	N.P.	Pantapec Oil	1,800	9¾	10	9¾	10	0
2¾	.20	.37	.25	N.P.	Peer Oil Corp.	.....	.....	.....	.....	.....	.....
22¾	12	13½	6½	$10	Pennok Oil	.....	.....	.....	.....	.....	.....
38	14½	24⅜	14½	25	Red Bank Oil	.....	.....	.....	.....	.....	.....
30¼	12	15½	2	N.P.	Reiter-Foster	1,200	4	4⅜	3⅞	4⅜	+ ⅜
27½	22	27½	15	$25	Richfield Oil	300	22½	22½	22¼	22¼	— ¾
7½	4½	7	4½	N.P.	Ryan Consolidated	.....	.....	.....	.....	.....	.....
10	7½	8	6	$10	Salt Creek Cons.	100	6½	6½	6½	6½	0
36	26⅞	32	27¼	10	Salt Creek Prod.	2,200	28⅜	29½	28⅜	29	0
4⅝	1⅜	7	2⅛	5	Savoy Oil	.....	.....	.....	.....	.....	.....
27	7⅝	26⅓	17	10	Tidal Osage	100	20	20	20	20	— 1½
25¾	7⅝	23¾	15	10	do non-voting	1,000	20¾	20¾	20	20½	— 2
....	....	88	63½	100	Transcontinental pfd.	300	83	83	81	81	—5
3	4⅛	7⅛	4¼	5	Venezuelan Petro.	6,600	6	6⅛	5½	5¾	— ⅜
31⅛	22	32⅝	20⅜	N.P.	Wilcox Oil & Gas	300	22¼	22⅝	22¼	22⅝	+ ¾
9½	4⅜	8	5¼	$1	Woodley Petroleum	500	5½	5½	5½	5½	0

•New High †New Low xEx-Dividend

Purchasers Named On A. P. I. Committees

DALLAS, Sept. 10.—Carl A. Young, director of the standardization division of the American Petroleum Institute, with offices at Dallas, has named members of the purchasing agents association to serve on a number of district sub-committees of the A. P. I., in line with recommendations previously made for co-ordinating the work.

The Institute was asked to make these appointments because of recognition that "purchasing agents can do more than anyone to get field superintendents and key men to work with and consider A. P. I. standards."

Director General Young announces the following appointments:

Texas Sub-Committees

E. R. Folmar, Magnolia Petroleum Co., Dallas, pipe committee; W. J. Morrison, Simms Oil Co., Dallas, rotary equipment committee; Curt Oppel, Atlantic Oil Producing Co., Dallas, pumping equipment committee; R. B. Newberry, Lone Star Gas Co., Dallas, belting committee.

Oklahoma Sub-Committees

W. H. O'Connor, Marland Companies, Ponca City, pipe committee; V. C. Fuller, Gypsy Oil Co., Tulsa, tankage committee; Frank H. Dunn, H. F. Wilcox Oil & Gas Co., Tulsa, derrick committee; F. W. Robertson, Skelly Oil Co., Tulsa, rig irons committee; G. A. Tompson, Empire Companies, Bartlesville, rope and cordage committee; H. W. David, T. B. Slick interests, Oklahoma City, cable tool drilling joint committee; G. C. Pohler, Mid-Continent Petroleum Corp., Tulsa, boiler committee; J. W. Shields, Pure Oil Co., Tulsa, pumping equipment committee.

Standard Oil Co. of New Jersey—Price at which stock may be purchased by employes during second half of this year is $35 a share. Price of stock under employe stock purchase plan is not to be more than 10 per cent below the average market price of the preceding three months.

Oklahoma Natural Gas Co.—Liquidating dividend of $1.13636 a share has been declared payable immediately. Dividend comes from proceeds of sale of 26,000 shares of stock in the new Oklahoma Natural Gas Corp. to Phillips Petroleum Co. at $25 a share.

F. Park Geyer, of Ponca City, Okla., and San Angelo, Texas, is now operating individually in the Crockett county area of the west Texas Permian age salt basin. He formerly was president of Marland Oil Co. of Texas and director of the parent Marland Oil Co. of Delaware.

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